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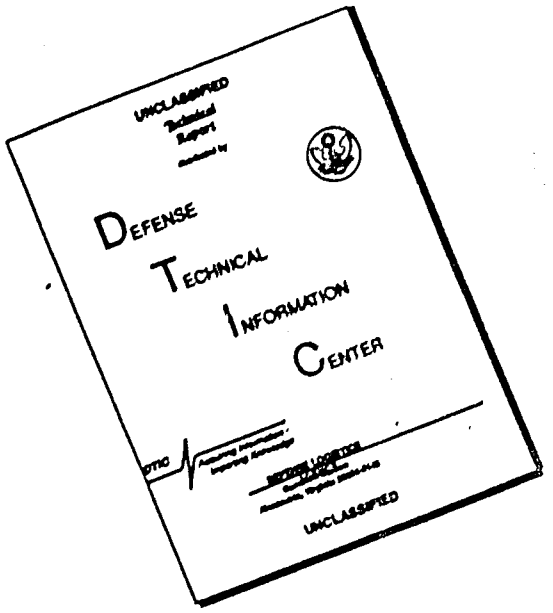

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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

IN REPLY REFER TO
AGAM-P (M) (17 May 68) FOR OT RD 681290 22 May 1968

SUBJECT: Operational Report - Lessons Learned, Headquarters, 168th Engineer Battalion (Cbt), Period Ending 31 January 1968 (U)

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2. Information contained in this report is provided to insure appropriate benefits in the future from lessons learned during current operations and may be adapted for use in developing training material.

BY ORDER OF THE SECRETARY OF THE ARMY:

Kenneth G. Wickham

KENNETH G. WICKHAM
Major General, USA
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DEPARTMENT OF THE ARMY
HEADQUARTERS, 168TH ENGINEER COMBAT BATTALION
APO US Forces 96289

EBA-CO 10 February 1968

SUBJECT: Operational Report Lessons Learned (RCS-CSFOR-65), for the Quarterly Period Ending 31 January 1968

THRU: Commanding Officer
79th Engineer Group
APO US Forces 96491

Commanding General
20th Engineer Brigade
ATTN: AVBI-OPN
APO US Forces 96491

Commanding General
United States Army Engineer Command, Vietnam (P)
ATTN: AVCC-P&O
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Commanding General
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TO: Assistant Chief of Staff for Force Development
Department of the Army (ACSFOR-DA)
Washington, D. C. 20310

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Section1, Significant Organization or Unit Activities

1. GENERAL: During the period 1 November 1967 through 31 January 1968, the 168th Engineer Combat Battalion continued its dual (general support) missions of combat support and cantonment construction. Combat support missions were conducted in support of the 1st Infantry Division, 25th Infantry Division, 101st Airborne Division; 199th Light Infantry Brigade, 11th Armored Cavalry Regiment, 5th Special Forces Group, 1st Signal Brigade, 1st Logistical Command and II Field Force Artillery. The majority of the construction effort was directed toward 1st Infantry Division base camps at Di An, Lai Khe, and Quan Loi, Republic of Vietnam (RVN). The battalion operated on a 7 day, 75 hour week, with Sunday mornings devoted to maintenance. The construction effort included the erection of mess halls, administrative facilities, maintenance buildings, water towers and fill stands, and troop billets at Di An, Lai Khe, and Quan Loi, RVN. The battalion continues to perform diversified and challenging combat support missions. The area of combat operations extended over 800 square miles and encompassed 21 different locations. Productivity and morale remained high. The battalion is well prepared for any new combat support and construction missions which may be assigned.

2. COMMAND: Lieutenant Colonel John R. Manning commanded the battalion during the entire quarter. Major Robert C. Riese continued as Battalion Executive Officer. CWO-2 D. F. Lane, First Lieutenant Gordon Nelson, Captain Peter J. Offringa, and Captain Richard Chandler continued to occupy the primary staff positions of S-1, S-2, S-3 and S-4 respectively. The Engineer Equipment Officer for the entire quarter was First Lieutenant William B. Nowell. Captain Douglas E. Holen, Captain Charles L. Mills, Captain Joseph P. Kish, Captain Raymond E. Knell and Captain Larry L. Payne retained command of Company A, Company B, Company C, Company D, and Headquarters Company respectively. Captain Eldon R. Johansen replaced Captain Roosevelt M. Scott on 8 December 1967 as commander of the 557th Engineer Company (LE). First Lieutenant William G. Gang retained command of the 168th Land Clearing Task Force. A current organization chart of the battalion is included as inclosure 1.

3. PERSONNEL, ADMINISTRATION, MORALE AND DISCIPLINE: The battalion maintained a relatively stable personnel status during the reporting period. The officer and senior non-commissioned officer status will be good until March 1968, when seven key battalion position will be vacated by rotation of personnel. Experienced first line supervisors continue to be in short supply. Sufficient Platoon Sergeants have been received but there is an shortage of personnel in the grade of Sergeant E5 and Staff Sergeant E6 with more than five years experience in their respective fields. The battalion continually operates with a 35% shortage in these grades. Rapid promotion of enlisted men provides some assistance, but lack of experience is still a critical problem. Sundry Fund operations of the Officers, NCO and EM clubs was continued. The battalion continued the policy of presenting a plaque to each departing member as a memento of his service in Vietnam. Purchase is made from the profits of the Sundry Fund. The following is a list of personnel actions which occurred during the quarter.

a. Summary Courts: 1

b. Special Courts: 3

c. Extensions: 70

d. Awards:

(1) Bronze Star Medal, Valor: 37

(2) Bronze Star Medal: 9

(3) Army Commendation Medal, Valor: 25

(4) Army Commendation Medal: 26

(5) Purple Heart: 71

(6) Air Medal: 4

An awards ceremony was held on 7 November 1967. Brigadier General Chapman, Commanding General, 20th Engineer Brigade presented awards to members of Company C and Company D for valor and achievements performed during forward airfield repair missions. On 17 November 1967 and 25 December 1967, General Chapman presented awards to members of the LCTF for valor and achievements during Operation Kunia and Operation Atlanta. Morale remained high in the battalion. Under Chaplain Rodeck, Chapel attendance has been good. When at all possible, services are conducted weekly at field locations.

4. INTELLIGENCE AND COUNTERINTELLIGENCE: The battalion S-2 section continued to perform intelligence evaluation and reconnaissance. Route and airfield reconnaissance was conducted throughout the battalion's area of operations. The section was responsible for daily reconnaissance of 31 kilometers of tactical road as part of the battalion's route maintenance responsibilities. Fifteen (15) forward airfields were evaluated on a monthly basis. In addition, detailed route reconnaissance was performed on LTL1A from Thuoc Vinh to Song Be, QL 14 from Dong Xoai to RJ311 (XT 290977) QL 14A from Loc Ninh to Bu Dop, RT 239 from Chon Tanh to the Michelen Plantation. The section continued to improve its techniques in "tunnel rat" operations. Classes were presented to members of the 86th Engineer Battalion in early November. The section continued the development of defensive plans for the battalion perimeter at Di An and reorientated a section of the berm to tie in with the new Air Cavalry defensive positions north of the battalion area.

5. PLANS, OPERATIONS, TRAINING:

a. Plans: The battalion developed plans for numerous minimum essential requirements (MER) for relocating elements of the 1st Infantry

Division at Lai Khe and Quan Loi. Four battalion sized MLR's and six company sized MLR's were designed. In addition, the airfield facilities at Quan Loi were redesigned to provide expanded fixed wing parking areas and helicopter refueling points. Plans were also developed for repair of forward airstrips at Chi Linh, Bunard and Bu Dang Special Forces Camp.

b. Operations:

(1) Combat Support: The advent of the dry season increased the battalion's combat support activities to a point where 72% of the battalion's effort was committed to supporting tactical operations at remote locations. Major combat support operations included:

(a) Forward Airfield Repair - Bu Dop (15 August 1967 - 11 November 1967): The 3rd Platoon, Company C, reinforced by equipment from the 557th Engineer Company (LE) improved the airstrip supporting Bu Dop Special Forces Camp. The task force was airlifted to Bu Dop by C-130, CH-54, and CH-47 aircraft from Bien Hoa, Phuoc Vinh, and Di An. Heavy equipment was transported by C-130 aircraft to Song Be airfield and then transported by CH-54 to Bu Dop. Airmobile equipment such as an Adams grader, a 1½ yard front loader and 2½ ton trucks were utilized. The existing airfield was extended 300 feet. A 300 foot by 225 foot parking apron and a 75 foot radius turnaround were constructed. Trees in the glide path were cleared and peneprime applied to the turnaround and parking apron for dust control. When the airstrip was certified to be capable of handling C-123 aircraft, M8A1 matting was transported to the site for surfacing of the turnaround. Higher priority missions precluded laying of the matting and the task force was extracted by CH-54 to Song Be on 11 November 1967. (see inclosure 2, After Action Report - Bu Dop)

(b) Artillery Fire Support Base Construction and Airfield Repair - Song Be (2 September 1967 - 5 December 1967): Company D, 168th Engineer Combat Battalion minus one platoon was airlifted from Bien Hoa to Song Be by C-130 aircraft to construct a fire support base for the 175mm guns of the 6th Battery, 27th Artillery. Three (3) D7E tractors were moved by C-124 aircraft. A defensive berm, eight feet high, with four corner bunkers and searchlight stands, eight intermediate bunkers, and a network of access roads were constructed. Four 175mm artillery gun pads with revetted laterite gun footings were built. In addition, nine 10 foot by 60 foot crew bunkers, a fire direction center, a metro bunker, an executive bunker, and four gun section ammunition storage bunkers were constructed. The airfield parking apron was expanded to 750 feet by 225 feet and 75 foot radius turnarounds were constructed at both ends of the airfield. These areas were treated with two coats of peneprime for dust control. Song Be came under mortar attack six times. One man was KIA. There were seven WIA. Four 5-ton dump trucks were damaged by mortar fragments. (see inclosure 3 After Action Report - Song Be)

(c) Forward Airfield Repair - Tong Le Chon (14 September 1967 - 5 November 1967): The third platoon of Company B, 168th Engineer Combat Battalion was airlifted from Lai Khe to the Special Forces camp at Tong Le Chon by C-130 aircraft on 14 September 1967 to repair mortar damage to the runway. On 17 September 1967 a C-130 aircraft became stuck in the turnaround which had degenerated as a result of heavy rainfall. Construction of a new turnaround began soon after. The area was crisscrossed with underground springs which weakened the subgrade and made construction difficult. A 75 foot radius turnaround was completed on 2 November 1967. Prior to extraction of the work force, the parking area was graded and compacted and the airfield drainage system improved. Most men and equipment had been airlifted back to Lai Khe by 5 November. The task force came under mortar attack three times. There were two WIA but no equipment damage. (see inclosure 4 After Action Report - Tong Le Chon)

(d) Forward Airfield Repair - Dong Xoai (8 November 1967 - 16 December 1967): The first platoon of Company A, 168th Engineer Combat Battalion was airlifted from Bien Hoa airfield to the Special Forces Camp at Dong Xoai by C-130 aircraft. Compaction equipment was transported from other project sites by CH-47 aircraft. The parking apron was expanded from 300 feet by 150 feet to 450 feet by 220 feet to accommodate three C-130 type aircraft. The airfield was regraded and compacted and the drainage system improved. The majority of the equipment was extracted by 16 December 1967, however, one dump truck still remains at the Special Forces Camp because C-130 aircraft are unavailable. (see inclosure 5 After Action Report - Dong Xoai):

(e) Drainage Improvement - Chi Linh (7 October 1967 - 15 November 1967): Company C, 168th Engineer Combat Battalion assisted by equipment and four men from the Australian Task Force designed and supervised the construction of a drainage system for the Chi Linh Special Forces Camp. Two backhoes mounted on farm type wheeled tractors and a 250 GPM pump were utilized to drain water from the defensive trenches surrounding the camp. More than 8,000 linear feet of drainage ditches were constructed. Personnel and equipment were extracted on 15 November 1967. (see inclosure 6 After Action Report - Chi Linh)

(f) Operation Fargo (18 December 1967 - 10 January 1968): Company A, 168th Engineer Combat Battalion provided combat support to the 11th Armored Cavalry Regiment in the opening of Route 13 from An Loc to Loc Ninh. A task force of 10 Rome plows, including four from the 15th Engineer Battalion, cleared 651 acres of jungle. A cleared area was established 100 meters on either side of the road. Large trees were bypassed and cut down by demolitions. Linear shaped charges were evaluated during this operation and were found to be extrememly effective against large diameter trees. The operation terminated on 10 January 1968, when the Rome plows closed to Loc Ninh. (see inclosure 7 After Action Report - Operation Fargo)

(g) Operation Kunia (19 September 1967 - 10 November 1967): Land clearing was conducted in the Ho Bo Woods and Filhol Plantation in

support of the 25th Infantry Division. The operation was under the control of the 1st Brigade, 25th Infantry Division. The security elements were the 4th Battalion, 23rd Infantry (Mech) reinforced by Company A, 2nd Battalion, 34th Armor. The Ho Bo Woods had long been a staging area for major enemy units operating in Hau Nghia Province. Mortar attacks on Cu Chi base camp had also been directed from this area. In 53 days of cutting, the Land Clearing Task Force cleared 11,650 acres of jungle. During this time 37 tractors were hit by mines and five tractors by RPG rounds. Seven tractors and six Rome plow blades were declared combat losses. Twenty-four (24) men were wounded. Trafficability was poor during most of the operation and cutting was restricted to the relatively high areas. Warmer weather increased the overheating problem and cutting hours were adjusted to effect maximum cutting effort during the cooler hours of early morning. The remote location of the base camps required that all maintenance and repairs be performed in the field. Resupply was entirely by air. The Land Clearing Task Force returned to Di An on 10 November 1967 for a ten day maintenance stand down. (see inclosure 8 After Action Report - Operation Kunia)

(h) Operation Atlanta (21 November 1967 - 23 December 1967): The 168th Land Clearing Task Force conducted jungle clearing operations in the Iron Triangle. This area had been a major Viet Cong stronghold for many years. The operation was under the control of the 1st Brigade, 25th Infantry Division. Security was again provided by 4th Battalion, 23 rd Infantry (Mech). In 33 cutting days, 10,895 acres were cleared and 315 acres windrowed. The land Clearing Task Force suffered eight WIA. Fifteen (15) mines were hit resulting in two combat loss tractors and two combat loss blades. Good trafficability and light enemy resistance resulted in a daily average of 330 acres cut. Significant plow effort was expended on less accessible areas along streams and ravines. The effect was a totally cleared area, but some reduced plow efficiency. Maintenance support during this operation was exce tional. Parts were flown to the o erations area daily from a maintenance base at Nha Loi. This procedure significantly reduced deadline time. The task force was extracted by convoy on 23 December 1967 (see inclosure 9, After Action Report - Operation Atlanta).

(i) Operation Saratoga (3 January 1968 - in progress at end of re orting period) The Land Clearing Task Force returned to the Ho Bo Woods and Filhol lantation to clear those ar as to which access was restricted during Operation Kunia because of extremely poor soil trafficability. The Viet Cong had continued to operate from these areas after Operation Kunia. Mortar attacks and harassment from the Ho Bo Woods area were still prevelant. The operation as under the control of the 1st Brigade, 25th Infantry Division. The 4th Battalion, 23rd Infantry (Mech) provided security for the cutting elements. The o eration commenced on 4 Jan 1968. During the 28 days the operation was conducted during this reporting period, 8110 acres of jungle were cleared. The enemy was extremely active during this operation and cutting was frequently halted for tactical action. The land clearing task force sustained two hits with RPG rounds and struck 59 mines while clearing jungle in the Ho Bo Woods. Thirty-two (32) men were wounded in action.

(j) Operation Manchester (8 December 1967 - in progress at time of report) The first platoon of Company D provided combat support to the 199th Light Infantry Brigade and the 101st Airborne Division during search and destroy operations in AO Strike, a heavily jungled area northeast of Tan Uyen. During the initial road clearing operation into Fire Support Base Nashua (XT 991326), one 3/4 ton truck and one 25 ton lowbed became combat losses when they hit mines. Three men were WIA. The Engineer platoon remained at the fire support base until 16 December when the majority of the personnel were airlifted back to Di An. At the end of the reporting period, four dump trucks, a five ton tractor and a D7E dozer continued to provide combat support within the fire support base. One hundred twelve acres of jungle have been cleared in the vicinity of FSB Nashua,

(k) Signal Facility - Nui Ba Ra (16 December 1968 - in progress at time of report). A squad of Company C 168th Engineer Combat Battalion constructed signal equipment sites and heliport facilities Nui Ba Ra mountain in support of the 1st Signal Brigade, II Field Force. The mountain rises 723 meters above the surrounding area. The slopes are extremely steep and are covered with thick jungle. There was a small cleared area of approximately 200 meter radius on the top of the mountain. Personnel, equipment and supplies had to be airlifted to the site. Working space was extremely restricted. A D6B tractor was airlifted by sky crane with only the blade and one track removed. After reassembly on top of the mountain a 75' by 75' helipad was cut unto the side of the slope. A 30' by 100' area was leveled and a timber platform constructed for placement of the signal vans. The site was operational by 2 January 1968. Fields of fire were cleared by use of bangalore torpedos because the surrounding jungle had been booby-trapped. At the end of this quarter, the equipment and men were preparing for airlift to the bottom of the mountain.

(l) Artillery Fire Support Base - Loc Ninh (28 December 1968 - in progress at end of reporting period) Company A, 168th Engineer Combat Battalion, initiated construction of a fire support base for 175mm artillery at Loc Ninh during Operation Fargo. Phase I of construction consisted of four gun pads, four corner bunkers for quad-fifty machineguns, six intermediate fighting bunkers, a FDC bunker and a commo bunker. Phase I was completed by 14 February 1968. Phase II, consisting of living bunkers, an executive bunker, roads, and drainage, was finished by the end of the reporting period. The drainage was complicated by the large vertical drop from one end of the fire support base to the other. To compensate for the 35 foot elevation difference, a system of checkdams and interceptor ditches was designed. Company A, minus one platoon, returned to Di An in the end of January. With only final drainage and landscaping remaining, the task force is scheduled for extraction in mid-February.

(m) Brigade Staging Area - Song Be (23 December - in progress at time of report). Company D, 168th Engineer Combat Battalion provided combat support to the 1st Logistical Command and the 101st Airborne Division by constructing a Brigade Staging area at Song Be. Initial

effort was expended on the construction of logistic facilities for II Field Force. An 18-point refueling pad, a takeoff and approach runway, and a heliport containing 28 aircraft revetments were constructed. Dust control was a major problem, particularly in the aircraft areas. Approximately 235,000 gallons of penerrime were sprayed to reduce the dust hazzard. T-17 membrane was placed on the takeoff and approach area. A 300' x 300' foot helipad for CH-47 aircraft was constructed adjacent to the ammunition supply point. More than 2200 meters of berm were constructed in the class V area. Concurrently, Company D performed continuous maintenance of the C-130 airstrip at Song Be. Approximately 90 cubic yards of rock and 120 barrels of RC-3 cutback were flown by C-130 and CH-47 type aircraft to Song Be for runway repair. Combat support was provided to the 101st Airborne Division. Perimeter fields of fire were cleared, bunkers dug in and slots cut for vehicle protection. In the next quarter, the task force will continue work on aircraft facilities, road construction, revetment construction, and erection of security towers.

(n) LOC Maintenance: During the reporting period Company B, 168th Engineer Combat Battalion relinquished responsibility for Route 13 from Phu Cuong to Lai Khe to the 34th Engineer Battalion and assumed maintenance responsibility for Route 13 from Lai Khe to Chon Tanh. Potholes were repaired utilizing 456 cubic yards of rock and laterite. Three culverts were emplaced. Company A maintained the alternate convoy route between Di An and Lai Thieu. The battalion maintained ready reaction forces at Di An, Lai Khe, and Quan Loi. Expedient road repair, crater repair and removal of brush blocks was accomplished 19 times by these reaction forces. Over 160 kilometers of road was cleared during the reporting period.

(o) Rome Plow Support (1 November 1968 - 31 January 1968): The Rome plows of the 557th Engineer Company (IE) supported the 1st Infantry Division from 1 November 1967 until 18 December 1967 on road clearing operations along Route 13 from Lai Khe to Quan Loi. Cleared areas were established for 200 meters on either side of the road. Fields of fire were cleared around Lai Khe and Quan Loi base camps. Approximately 455 acres of jungle were cleared during these operations. From 19 December 1967 until 22 January 1968, the plows supported the 11th Armored Cavalry Regiment during Operation Fargo. On 23 January 1968, the plows were moved south to the vicinity of Chon Tanh to support the 101st Airborne Division in Operation Casey. The plows cleared five fire support bases and two landing zones along Route LTL13 and Route 246. With the completion of Operation Casey, the plows were again moved north to clear fields of fire around the artillery support base under construction at Loc Ninh.

(p) Operations involving Company A, 27th Engineer Battalion (19 January 1968 - 29 January 1968): During this period of peak committment, Company A, 27th Engineer Battalion was under the operational control of the battalion to perform combat support operations in the Nui Ghai Secret Zone in support of the 11th Armored Cavalry Regiment. Initially, a platoon was airlifted into Minh Thanh Special Forces Camp to apply dust

palliative to the airfield and helicopter landing areas. The airfield was shaped and graded, ditches were improved and 21,000 gallons of peneprime were applied to the runway and parking apron. The remainder of the company moved to Chon Tanh on 26 January 1968 to assist in opening Route 239 into the Michelin Plantation. Three hasty stream crossings were effected and expedient road repair accomplished where required. The entire company was extracted from the Michelin and Minh Thanh on 29 January 1968.

(q) Local Security: Weekly platoon sized ambush patrols were conducted at Di An under the control of the S-2. Security measures were intensified at all base camps during the Christmas and Tet holidays. Company B, the ready reaction force at Lai Khe was called upon in November to provide security for a downed helicopter. The battalion frequently provided its own job site security since tactical elements were often committed to higher priority projects.

(r) Other Combat Support: The battalion continued to provide equipment support, technical assistance, and on-call combat support to tactical units within its area of operations. Company B and Company C provided back-up support to all 1st Infantry Division Operations. Mine sweep teams, expedient repair crews, and haul support were furnished as required. The battalion provided mine sweep teams for a total of 47 days during the reporting period. Over 415 yards of fill were hauled in direct support of 1st Infantry Division operations. Company B repaired damaged structures in the 1st Division AO to include the Ben Cat causeway and the Ben Cat Bailey Bridge. (see inclosure 10 After Action Report - Ben Cat Bailey Bridge). In addition, failures in the Lai Khe airfield were repaired in preparation for the coming rainy season (see inclosure 11 After Action Report - Dozer Field). The battalion maintained a ready reaction mission to repair damage to forward airfields. In late November, a squad from Company D flew to Loc Ninh airfield to repair mortar damage to the parking apron. In mid-December, the squad again flew to Loc Ninh to repair similar damage to the M8A1 matting on the turnaround. In early January, a squad of Company D was airlifted to Bu Dop Special Forces Camp to repair the parking apron and apply dust palliative to the runway, parking apron and turnaround. Approximately 18,000 gallons of peneprime were applied to the aircraft facilities. Companies C and D provided technical advice and equipment support to Company A, 5th Special Forces Group is the construction of B team headquarters at An Loc and Song Be respectively. Land was cleared, berms constructed, buildings dug in, and living quarters constructed on a self-help basis. At Quan Loi, Company C assisted the 6th Battalion, 27th Artillery in the construction of FDC, commo, and executive bunkers, gun pads, and design of a site drainage plan. During airfield repair operations, assistance in construction of bunkers and fortifications was provided at Loc Ninh, Tong Le Chon, Bu Dop, Dong Xoai, Chi Linh, and Minh Thanh Special Forces Camps. Convoy support to include shotguns was provided as required on the convoy runs to Lai Khe, Quan Loi and Loc Ninh.

(2) Cantonment Construction: During the reporting period construction continued at Di An, Cam Lei, and Lai Khe base camps. An increased committment to combat support reduced the available work force, however, the battalion continued to produce work of consistently high quality. Relocations of tactical units within the battalion's area of operations resulted in increased emphasis on providing minimum essential requirements (MER).

(a) Di An: Companies A and D, 168th Engineer Combat Battalion, continued construction of the main base camp for the 1st Infantry Division Support Command, and the adjacent base camp for the 2nd Brigade, 1st Infantry Division. On the main base, production included 10,400 square feet of troop billets (technical assistance and supervision of self-help); one mess hall, 1,520 square feet; one maintenance shop, 1,280 square feet; a 44 feet high air control tower; a chemical storage yard, 9,000 square feet; and 185,000 square feet of maintenance hardstand. At the end of the reporting period, work continues on maintenance facilities, hardstands and drainage. The main base is 87% complete, up 2% from the last three months. The battalion continued work on the construction of MER for the 3rd Squadron, 17th Air Cavalry until mid November when the project was turned over to the 34th Engineer Battalion for completion. The project was 44% complete at turnover. A total of 134,000 cubic yards of laterite had been hauled and placed and 26 aircraft revetments constructed. Company A completed a sophisticated concrete horizontal complex to be utilized as a IWCS Communications site. In the 2nd Brigade area, construction completed during the quarter included 31,200 square feet of troop billets, 24,000 square feet of hardstand, 130 linear feet of culvert, and 700 linear feet of ammunition supply point berm. The 2nd Brigade area is now 82% complete, up 4% from the last reporting period. In general, the Di An construction program is nearly complete; all essential facilities have been constructed. The estimated completion date for the entire project is 1 May 1968.

(b) Lai Khe: Company B, 168th Engineer Combat Battalion, supported by a platoon of the 557th Engineer Company (LE) has primary responsibility for the cantonment construction program for the 3rd Brigade, 1st Infantry Division and the providing of MER for the incoming Division Headquarters. During the period 1 November 1967 to 31 January 1968 the following construction was completed: 840 linear feet of culvert, 11,220 square feet of troop billets (self-help), 320 latrine holes, 172 shower heads, 2,840 square feet of mess halls, 960 square feet of maintenance buildings and 52,670 square yards of laterite hardstand. One water tower and fill stand is under construction. A 48 pad heliport is 42% complete. Overall cantonment construction is preceding well; the project is 82½% complete. At the close of the reporting period, work continues on maintenance buildings, Post Exchange facilities, troop billets, and aircraft revetments. MER for incoming 1st Division units is proceeding well with most units possessing necessary facilities. Six company sized and four battalion sized MER's are currently underway. A series of ammunition fires necessitated the construction of a new ASP.

Over 26,000 cubic yards of fill have been hauled to construct protective berms. Company B completed an MER for a MUST Hospital at Lai Khe. A helicopter landing complex of six pads, four revetments, and interconnecting roads was constructed. Pads were placed for the inflatable buildings and drainage established.

(c) Quan Loi: Quan Loi grew into a fully operational base camp during this reporting period. A brigade living area based on the "hotbed" concept was planned and constructed by Company C, 168th Engineer Combat Battalion, assisted by one construction platoon from Company B, 34th Engineer Battalion. Each company sized unit was provided a 20'x48' tropical administration building, a 20'x32' tropical storage building and a 16'x32' concrete mess hall slab. Sufficient tents were provided to accommodate approximately 60% of the troops based there on the assumption that at least one battalion would be in the field at all times. A total of 24 administrative buildings, 25 supply rooms and 25 mess hall pads were built. Eight helicopter pads were constructed and 15 aircraft revetments placed along the runway. The MER is more than 90% complete at present. Work continues on enlargement of the aircraft facilities, construction of helicopter refueling points, capping of roads with laterite, and drainage improvement.

c. The 168th Engineer Combat Battalion integrated training programs with combat support and construction operations. Orientation training was conducted for new personnel at 1st Infantry Division Replacement Training Schools. Publication of the new Battalion Master Training Schedule and the institution of training periods on Sundays improved the individual soldier's knowledge and proficiency. The battalion conducted three major training programs during the quarter. For six weeks in November and December, the battalion conducted training exercises for members of the 301st and 302nd ARVN Engineer Battalions. Classes were given in mine warfare and airfield repair. Practical exercises were conducted in equipment operation and mine field laying. Individual participation was stressed. Final evaluations were made and indicated an improved level of proficiency. Training operators for the 168th Land Clearing Task Force had a high priority within the battalion. Equipment operators were infused into the land clearing team and given preliminary instruction in Rome plow operating techniques. After a period of OJT, in which the driver operated near a tractor driven by an experienced man, he was allowed to proceed on his own. Programs for improving maintenance were provided to the line companies by the battalion maintenance mobile inspection team. Instruction was presented during a two to three day visit. Emphasis was placed on equipment serviceability checks, care of log books and operator maintenance responsibility.

6. LOGISTICS: During the reporting period the 168th Engineer Battalion continued its command emphasis on improving logistical management. Special emphasis and direction were applied at unit supply level. There was a noticeable improvement of logistical transactions and support from direct and general support activities. The influx of new personnel caused general reorganization of much of the logistical activities. In spite of the enormous improvements, fill of certain items of supplies

and equipment remained to be a major problem. Typical of these supplies and equipment are electrical fixtures, butt hinges and engineer construction equipment. The 506th Field Depot conducted a back order reconciliation program during this quarter. Fill of reconciled or re-requisitioned items was accomplished within ten days after processing, an outstanding change from past performances. A sampling of items received after depot reconciliation were radiacmeters, skill saws, engineer squad carpenter sets, general mechanic tool sets and an assortment of hand tools and mechanical tools and apparatuses. Many of these items had been on due-out for nearly one year. Engineer equipment and major items of ordnance equipment which remained in short supply at depot and incountry as indicated by follow-up action were road graders, water purification sets, engineer shop equipment trucks, scoop loaders, semi-lowbed trailers, tractor trucks of 5-and 10-ton capacities. Also in short supply were cranes, truck mounted 20 tons; cranes, crawlers 10-tons; 5-ton dump trucks and one-quarter ton trucks. Combat support missions of the battalion expanded rapidly in scope and intensity during the quarter. Approximately 3,600 tons of construction and combat support materials were transported in support of construction projects and combat missions. Nearly 637 tons of the total shipment went by US Air Force aircraft into areas inaccessible by land routes. The following figures reflect the magnitude of supplies moved by the battalion during the period.

LOCATION	TOTALS
Saigon to Di An	281.3 tons
Long Binh to Di An	2532.1 tons
Di An to local projects	51.5 tons
Di An to Quan Loi	160.4 tons
Di An to Loc Ninh	305.1 tons

First Logistical Command delivered 450 tons of the above materials. All project resupply missions were by armed convoy or aircraft. The United States Air Force air-lifted peneprime for dust control, asphalt, gravel and equipment into areas inaccessible by road for maintenance and repair of vital airfields and air facilities. Five men were placed on temporary duty to a major airbase to accept and prepare these materials for air shipment. Since the battalion supply section has no TO&E personnel to operate a construction material section, the water supply personnel not engaged in water point operation are used to man the material section. As water supply commitments increased, the water supply personnel were argumented with transient personnel to handle construction material. Because of the increased requirement for dust palliative at airfields and helicopter landing areas, peneprime and T-17 membrane became important commodities. Peneprime required for forward airfields and helicopter landing areas far exceeded our stockage level. It was necessary to obtain much of the peneprime on combat essential basis thereby requiring shifting of priorities by 1st Log agencies. Heavy timber and three inch (thickness) lumber is still very difficult to obtain. Basic loads of bridge timber were used for Fire Support Base construction. Three inch lumber in width

dimensions 6" thru 12" and suitable lengths for use as lateral and diagonal bracing of tower structures was not available. The 168th Engineer Battalion Land Clearing Task Force (27th LCT) engaged in two (2) major land clearing operations during the quarter. There was a significant increase in the number of combat losses. The two most common types of equipment severely damaged or destroyed were D7E tractors and Rome plow blades. Combat losses of tractors and Rome plow blades appeared directly proportional to certain types and quantities of supplies the Viet Cong had in the area of operation. During one operation, the peak frequency of loss for D7E tractors was seven during a twenty-seven day period. A peak for combat loss for Rome plow blades on another operation was eleven blades during a twenty-four day period. These figures are examples of combat losses only. Much more equipment becomes severely damaged but repairable. Obviously such combat losses have created critical shortages. The tractors were damaged by mines and RPG-7 rounds. Most damages occured at the track and frame assemblies, belly areas, radiators and engines of the D7E tractors. Characteristic damage to Rome plow blades has been the bending of blades beyond the point that cutting edges can be fitted on them. The C-frames of the Rome plows, push arms and cab guards are very rarely damaged. Prior to the current shortages, Rome plow blades and accessories were replaced by expeditious supply action. Upon confirmation of a combat loss, replacement requisitions were hand carried through the supply system and normally the replacement was received the same day, deprocessed and immediately dispatched to the area of operation. Replacement issue of combat loss of D7E tractors is rapidly becoming an acute problem. The loss of these tractors have apparently exceeded expected losses. Unless immediate action is taken to expedite shipment of both D7E tractors and Rome plow blades into Vietnam, the use of this revolutionary instrument of war may be hampered.

7. FORCE DEVELOPMENT: Refinement of the 168th Land Clearing Task Force was the primary organizational innovation of the quarter. Each successful operation reinforces the essential need for a permanent command and control structure with an independent maintenance and supply capability. The newly determined MTO&E for an engineer land clearing company will provide an acceptable solution to this requirement. Additional refinements continue to be made. An M548 carrier was tested as a tracked maintenance contact vehicle and was an outstanding success. Three additional M548's have been procured to provide a more responsive maintenance capability on the cutting site. Operation Atlanta emphasized the requirement for an organic wrecker and steps have been taken to procure one. The need for additional radio operators and a parts clerk have been recognized. Additional changes become obvious as the scope of land clearing missions widens. The battalion's organization was further challanged by the variety and extent of its operations. Rome plow support with the organic assets of the 557th Engineer Company (LE) have resulted in the formation of a Rome plow task force with an NCOIC, air compressor and maintenance capability. The procurement by the 557th Engineer Company (LE) of 12 each 290M with 9 scrapers caused the formation of an earth moving section which is capable of attachment to any light equipment platoon. Water distributing and compaction equipment are being

requisitioned to supplement this haul capacity. The battalion continues to devise flexible responses to the unique missions it encounters.

8. COMMAND MANAGEMENT: The diversification of the battalion's operations requires unique applications of management procedures to efficiently allocate the battalion's resources. Careful programming of equipment requirements was necessary to allow equipment to be airlifted from one site to another as needed. Construction schedules provided contingency plans to allow for delays in supply and equipment input because aircraft support was unreliable. Resupply missions had to be programmed to achieve the maximum number of sorties when aircraft were available. Supervision and evaluation of the battalion was obtained through the use of roving inspection teams from maintenance, supply, training, and administration. The Battalion Executive Officer monitored the overall management program.

9. INSPECTOR GENERAL: Major Robert C. Rioso continued as acting Inspector General. During the quarter two I.G. complaints were received. The battalion continued to emphase solution of problems at the lowest command level possible. Commander's were encouraged to make themselves accessible to personnel with problems.

10. INFORMATION: The battalion newspaper continued publication on a bimonthly basis. Eighty-two (82) home town news releases were dispatched regarding awards presented during various operations of the battalion. Operations of the Land Clearing Task Force were publicized in Newsweek, Army Digest and the Stars and Strips.

11. CIVIC AFFAIRS: The battalion surgeon and chaplain continued their efforts in support of the orphanages in the Di An area. During the reporting period, Company A completed a 27'x52' masonry building which is in use as a nursery. Two 27'x26' rooms are presently being added to the Di An High School, an earlier civic action project of the battalion. Local institutions supported by the Battalion Civic Action Program include the Go Vap II Orphanage, Xuan Hiup (XT 933029), Xuan Truong Orphanage (XT 932020) and Saint Therese School at Dong Hoa (XT 947038). Assistance rendered consisted of the following:

a. Excess food collected by unit mess halls was periodically distributed. A total of 8,000 pounds of food was collected.

b. MEDCAPS were conducted by the battalion surgeon. Fifty-two visits were made and 1,446 patients were treated.

c. English classes were taught by the battalion chaplain and battalion civic action specialist. Twenty-four classes were taught with a total attendance of 195.

d. Voluntary contributions by members of the battalion amounted to 72,000 piasters. This money was donated to the Saint Therese School at Dong Hoa. During the Christmas season, approximately 700 packages were received from the United States. Contents consisted of clothing, toiletries, towels and children's toys. More than 1,300 individual children's presents were gift wrapped by the battalion for distribution during Christmas and Tet.

Section 2, Part I, Observations (Lessons Learned)

1. Personnel:

a. Personnel Services

ITEM: Banking Facilities

DISCUSSION: There are no banking facilities available to members of the battalion. The nearest offices are at Long Binh or Saigon. Most personnel have not established bank accounts in CONUS prior to their arrival in Vietnam. APO's and Army Finance do not provide sufficient substitute service.

RECOMMENDATION: At least a small banking facility should be established at each major permanent base camp to provide services to military personnel for the purpose of establishing checking accounts, sale of US Savings Bonds, and Travelers Checks.

b. Personnel Accounting:

ITEM: Morning Report Entries

DISCUSSION: The 27th Engineer Battalion is located twenty miles from Di An. It is extremely difficult to transmit to the 27th Engineer Battalion all information necessary for that unit to make timely and accurate morning report entries regarding personnel of the 27th Land Clearing Team.

OBSERVATION: The 27th Land Clearing Team should be established as a morning report unit separate from the 27th Engineer Battalion. This would permit its assignment to this battalion. Full administrative responsibility for the team could then be assumed.

2. Operations:

a. Aircraft Revetments:

ITEM: Weather sealing of aircraft revetments.

DISCUSSION: The interior of aircraft revetments if filled with loose silt, clay or laterite. The monsoon rains soak this material, increasing soil pressure and causing failure of the revetment. An expedient waterproofing material can be fabricated from the plastic lining of 105mm ammunition boxes. These 4'x8' strips of heavy plastic can be glued with T-17 membrane glue. One layer of sandbags can then be placed on top of each revetment so that the plastic cannot be blown off by incoming aircraft.

OBSERVATION: This waterproofing technique has not yet been subjected to heavy precipitation. Preliminary tests indicate that it would be a simple and inexpensive means of waterproofing revetments.

b. Ammunition Storage:

ITEM: Expedient Ammunition Storage bunkers

DISCUSSION: Safety and security regulations require a 3' earth wall or revetment around all ammunition storage areas. A rapid and simple solution to this requirement is the utilization of empty 105mm ammunition boxes. These boxes measure 39" in length. When filled with soil or other loose material they provide excellent revetments. In addition, the hinges, when removed, can be used on doors and latches for burn out latrines (see figure 1, Inclosure 12).

OBSERVATION: Revetments constructed from ammunition boxes is a simple, quick, and inexpensive means of providing protection for stored ammunition.

c. Dust Constrol:

ITEM: Expedient de-drumming facility.

DISCUSSION: During the past quarter, the battalion had several missions to apply dust palliatives to forward airfields. The mission had to be accomplished rapidly with a minimum amount of equipment. Although trailer mounted poneprime distributors were generally available, de-drumming and loading these distributors was a major problem.

OBSERVATION: Three solutions were determined by the battalion:

(1) Bulldozer available: Cut a slot into the ground to a depth greater than the height of the distributor. Place two 4"x4" timbers across the top of the slot one barrel diameter apart. The poneprime distributor may then be moved into the slot under the 4"x4" timbers, the barrels rolled to the slot, opened, and emptied using the timbers as supports. A creased piece of roofing tin may be used as a funnel (see Figure 1, Inclosure 13).

(2) Front loader and 5-ton truck available: Barrels may be lifted by the front loader, placed on the 5-ton bed, opened and poured from the dump bed into a distributor placed beneath the tailgate (see Figure 2, Inclosure 13).

(3) Areas inaccessible to fixed wing aircraft: Rig an "A" frame on a 3/4 ton truck. By use of barrel hooks, the drums may be opened, lifted by the hoist and emptied into the distributor. The 3/4 ton may then be used to tow the distributor. Both the 3/4 ton truck and the empty distributor can be airlifted by CH-47 aircraft (see Figure 3, Inclosure 13).

d. Dust Control:

ITEM: Use of T-17 membrane as a dust control agent.

DISCUSSION: The dry season necessitates massive dust control measures particularly when constructing heliport facilities in virgin areas. Clearing of these facilities creates areas covered by several inches of dust. Penepriming of these areas is exceptionally difficult since many applications are necessary to bind the fine soil particles.

OBSERVATION: A rapid, expedient solution to dust control on large areas of this type is to cover it with sheets of T-17 membrane. The membrane is anchored by burying, and sandbags may be utilized along the joints to secure them against updrafts.

e. Forward airfields:

ITEM: Anchoring of M8Al matting.

DISCUSSION: Repair of anchoring systems of M8Al matting at forward airfields requires an effective system which does not require the use of heavy equipment. A minimum equipment committment is desirable since aircraft support from the US Air Force to extract heavy equipment is unreliable. Burying requires heavy equipment for compaction and reinforcing bars often pull out of soft soils.

OBSERVATION: An extremely effective anchoring device is the steel kit ground anchor, FSN 8340-951-6423. The device can be driven through holes in the matting by use of hollow steel pipe and a sledge hammer. The bar is then tack welded to the matting. The arrow rotates 180 degrees when force is exerted on it. A D7E tractor is required to extract this device from soft clay (see Figure 1, Inclosure 14).

f. Forward Airfield Repair:

ITEM: Movement of a task force by air.

DISCUSSION: Personnel and equipment are moved to most forward airfield repair sites by air. The limited amount of aircraft in Vietnam frequently prohibitis the movement of the entire task force at the same time. The Air Force's present system of priorities caused equipment and personnel to be piecemealed into the site. Often dump trucks would arrive at the site, but the flights carrying the dozer and front loader would be cancelled at the last minute. Air Force rules prohibited the rearrangement of equipment on flights so substitutions could not be made after aircraft carrying critical equipment were cancelled. Delays of two to three weeks between flights were not unusual. Many equipment hours were lost because critical equipment was not on hand at the work site or because valuable equipment remained unused at the air terminal awaiting flights. Similarly, when equipment was withdrawn from the site, last minute cancellation of aircraft resulted in one or two pieces of

equipment remaining behind. This cargo was then considered to have too low a priority to warrent the diversion of an aircraft sortie. One front loador remained at Tonglo Chon 45 days awaiting a flight. It finally returned on a C-130 aircraft that had delivered cargo to the site and was returning empty. At the close of the reporting period one dump truck has been at Dong Xoai airfield 82 days awaiting air transportation.

OBSERVATION: Airlifts of task forces into forward airfields are inefficient if the entire force is not transported within 2 to 3 days. One critical piece of equipment that does not arrive may delay the beginning of work. The entire task force should be considered as a single airlift with one joint priority.

g. Demolitions:

ITEM: Use of bangalore torpedoes for clearing jungle.

DISCUSSION: The battalion's mission on Nui Ba Ra required that jungle be immediately cleared to provide even minimal fields of fire. The Vietnamese troops that had previously secured the mountain-top had used numerous booby-traps to secure their perimeter. The locations of those booby traps were unmapped.

OBSERVATION: Since time was critical, hand clearing of the perimeter was not feasible. Thirty foot lengths of bangalore torpedos were used to clear the perimeter. The blast from these demolitions not only detonated the booby traps but cleared the dense foliage as well.

h. Land Clearing:

ITEM: Piling of cut jungle.

DISCUSSION: The Land Clearing Task Force accomplished some piling during Operation Saratoga so the accumulated jungle could be burned. Either Rome plows or bull blades can be used successfully, but cannot be used together because the blades have different angles. Piling reduces acreage cut by approximately 60%.

OBSERVATION: Either all Rome plows or all bull blades should be used for piling. Since Rome plow resources are limited and piling reduces acreage cut, it should be used only where tactical necessity dictates.

i. Land Clearing:

ITEM: Cab reinforcement is necessary before cutting large timber.

DISCUSSION: Cutting trees greater than 40" in diameter requires that special cab modifications be made to avoid crushing the operator under falling timber. An operator in another land clearing team was killed with a tree fell upon his cab and crushed it.

j. Land Clearing:

ITEM: Clearing areas believed to be mined.

DISCUSSION: When cutting is channelized or otherwise restricted by terrain, an increased number of mines have been encountered. Areas of this type may be assumed to be mined.

OBSERVATION: Where mines are anticipated, tactical sweeps by the security battalion, visual mine detection, artillery and mortar preparation and reconnaissance by fire will reduce combat losses by 50%.

k. Communications:

ITEMS: The battalion's widely separated operations require rapid communications.

DISCUSSION: The battalion cannot communicate directly with all its subordinate units. The 79th Group Relay was overtaxed supporting two combat battalions.

OBSERVATION: A radio relay consisting of an AN/PRC 25 with antenna group RC 292 and two operators, was established on the top of Nui Ba Den (XT 281582). The relay station is able to contact all battalion units directly. The average number of messages handled by the relay station is 75 messages per day.

3. Intelligence: Reconnaissance

ITEM: Daily road reconnaissance is essential to insure rapid reaction to road interdiction.

DISCUSSION: Increased enemy activity on main supply routes requires close surveillance of roads. Rapid reaction to road interdiction within the battalion's area of operations is essential to maintaining adequate resupply to tactical units.

OBSERVATION: A visual, aerial reconnaissance of all important roads in the battalion's area of responsibility must be made daily at first light. The battalion's reaction time is increased by one to two hours by advance knowledge of pending missions.

4. Training and Organizations:

a. Maintenance:

ITEM: Operation of multifuel engines

DISCUSSION: During the past quarter, twelve 5-ton engines had to be replaced in the battalion. Investigation into the causes of this maintenance problem revealed that a possible cause of engine damage was improper starting and stopping procedures. Observation of drivers indicated that in a large number of cases, incorrect starting and stopping procedures were being used. Immediate corrective measures, to include instruction classes and close supervision of operators substantially reduced engine failures during the final 30 days of the reporting period.

OBSERVATION: Correct starting and stopping procedures for multifuel engines must be strictly observed. Proper instruction and close supervision are essential to insure compliance with proper maintenance procedures.

b. Maintenance:

ITEM: Equipment on temporary loan.

DISCUSSION: The scope and variety of the battalion's mission requires that equipment frequently be borrowed from other units. During the past quarter the battalion has been required to obtain the following equipment to successfully accomplish its mission:

290M tractors w/scrapers	30 each
D7E	10 each
Motorized graders	5 each
5-ton dump trucks	16 each
Asphalt distributors	2 each
2½-ton dump trucks	6 each
Airmobile grader	1 each
D6B	2 each
1½ yard front loader	1 each
Entrencher	1 each
Backhoe	2 each

The battalion PLL was neither suitable nor sufficient to properly support this increased equipment density. Repair parts for unusual pieces of equipment were extremely difficult to obtain, and usually had to be fabricated in rear areas. In addition, the battalion did not have sufficient mechanics to provide complete maintenance support.

OBSERVATION: All equipment on temporary loan should be accompanied by an operator. The battalion should be given access to the lending unit's PLL. Sufficient mechanics should be requested from the lending unit to supplement the battalion's maintenance capability. Similar procedures should be followed by the battalion when organic equipment is lent to other units.

c. Maintenance:

ITEM: Reporting of deadlined equipment.

DISCUSSION: Tactical units in isolated locations require rapid replacement of defective parts to minimize inoperative time. A normal deadline report normally furnished insufficient information and retransmission of reports through radio relays sometimes caused inaccuracies in nomenclature. Occasionally it was not possible to determine what part was required. On other occasions the wrong part was sent. A system of deadline reporting for forward areas was developed that included sufficient cross-checks to eliminate errors. Parts were requested by nomenclature, Federal Stock Number, Technical Manual number and page.

OBSERVATION: Requests for parts from forward units cannot be filled unless the requests are accurate. A detailed reporting system with cross-checks is the only means of insuring rapid resupply of spare parts.

d. Maintenance:

ITEM: Third echelon maintenance contact teams.

DISCUSSION: The battalion frequently operates in the areas accessible only by air. Since air transportation is in short supply, equipment deadlined for third echelon repairs cannot be evacuated to rear areas. It is imperative that third echelon contact teams be provided to each operation of company size or larger. Contact teams of tactical units the battalion supports must also be supplemented with engineer mechanics to compensate for the large increase in engineer equipment density.

OBSERVATION: At least 10 days prior to impending operations notice must be given to the DSU. It is then possible for supporting maintenance units to reallocate their resources to meet changing equipment densities throughout their area of operations.

e. Maintenance:

ITEM: Use of the 218th Collection Classification and Salvage (CC&S) Yard.

DISCUSSION: DX and PLL parts from the DSU are extremely difficult to obtain. The battalion maintenance section has been forced to utilize the 218th CC&S Yard to obtain critical repair parts. Most of the battalion's stock of brake shoes, wheel cylinders, wheel seals, air packs propeller shafts, jack shafts, tires, tubes, carburators and radiators are obtained through this source.

OBSERVATION: The 218th CC&S Yard is a valuable source of repair parts not available through normal channels. If each time a part is obtained, a demand is recorded with the DSU, their PLL will eventually be sufficient.

f. Maintenance:

ITEM: Engine wear in land clearing operations.

DISCUSSION: Many of the tractors in the Land Clearing Task Force have operated for more than 2000 hours. An increase in engine failure is expected in the near future. This quarter a substantial increase in worn engines was noted. Wear is caused by two factors.

(1) Land clearing operations exert a steady, near-maximum load on the engine. The all-purpose D7E was not designed for this type of load.

(2) Excessive dust in the dry season caused increased wear on engines. This is particularly noticeable in pistons and piston sleeves.

OBSERVATION: Increased engine replacement will be necessary in the next quarter. At present, insufficient engines are incountry for D7E replacement in the land clearing task force. At least six D7E engines should be on hand at the DSU at all times.

g. Maintenance:

ITEM: Overheating of D7E engines during land clearing operations.

DISCUSSION: Clogged radiators are inherent in land clearing operations. The ambient temperature increase during the dry season aggrevates the overheating problem caused by radiator blockage. Radiators must be blown out repeatedly with air compressors reducing cutting time. Overheating which is unnoticed results in cracked heads.

OBSERVATION: The D7E radiator capacity is insufficient for jungle clearing operations.

h. Maintenance:

ITEM: Shortage of repair parts.

DISCUSSION: The battalion PLL has only a 47% fill. Approximately 20% of the parts on hand have been secured through "scrounging". The flow of parts through the DSU has been unsatisfactory. Of 1872 requisitions submitted in November and December, 232 had been filled as of 31 January 1968. Direct exchange items are also critically short. At the close of the reporting period, there were 203 direct exchange due-outs for brake shoes, 33 due-outs for starters, 13 due-outs for distributors, 10 due-outs for radiators, 34 due-outs for generators, 114 due-outs for wheel cylinders, 26 due-outs for hydrovacs, 12 due-outs for carburators, 9 due-outs for fuel pumps and 45 due-outs for regulators from the DSU.

OBSERVATION: Parts supply from the DSU for the battalion is totally inadequate. The battalion's maintenance program survives only because maintenance personnel spend much of their time securing repair parts through "scrounge" channels.

5. Logistics:

a. Transportation:

ITEM: Transport of gravel into areas inaccessible by land.

DISCUSSION: Gravel was needed to repair and maintain forward airfields during the quarter. Fixed wing aircraft were favored over helicopters for this task. Fifty-five (55) gallon barrels, the remnants of peneprirning operations, were used to transport the gravel. The gravel (1½ minus) was packed in the barrels, the lids tack welded and the barrels palletized on Air Force light weight aluminum pallets for shipment. Each barrel weighed about 750 pounds.

OBSERVATION: Barrels are the most economic and durable container for shipment of gravel by C-130 aircraft.

b. Transportation:

ITEM: Airlift of the D7E tractor by C-130 aircraft.

DISCUSSION: The battalion airlifted D7E's into Song Be airfield by C-124 aircraft. The runway length prohibited extraction of the tractors by C-124 aircraft. The D7E's had been airlifted by C-130 aircraft in the past by removing the blade, belly pan and winch and walking the tractor out of its tracks (see ORLL, period 1 February 1967 to 30 April 1967). This is an extremely complex operation and damage to the aircraft could result if the tractor slipped off its tracks prematurely or got hung up on the dunnage. The battalion extracted its D7E's by C-130's from Song Be with the tracks on. An earthern loading ramp was first pushed up adjacent to the parking apron. The blade, winch and belly pans were then removed, reducing the tractor weight to 39,000 pounds. A specially rigged C-130 aircraft, with a stripped cargo area and minimum fuel load was flown to the site. The cargo ramp was placed in the horizontal position and hinged joint cribbed with 6'x6' timber and sandbags. The tractor then walked up the ramp and into the aircraft. The loaded craft lifted off the runway at the 2900-foot mark.

OBSERVATION: If this technique could be utilized to airlift D7E's into C-130 type II strips, forward airfield repair missions would be greatly facilitated. Use of D7E's instead of D6B's would reduce construction time by approximately 20%.

c. Supply:

ITEM: Forecast of dust palliative requirements.

DISCUSSION: During this quarter there were continuous requirements for dust palliatives, particularly at tactical airstrips and helicopter landing areas. The most commonly used dust palliative is Asphalt Soil Binder, FSN: 5610-979-3034 (peneprime). Estimation of

requirements for dust palliatives are usually made during the wet season by someone who has never experienced the dry season. It is vitally important not to underestimate the unit spreading capabilities of dust palliative when forecasting requirements. An engineer platoon can apply approximately 500 barrels of penoprime in a 24-hour period.

OBSERVATION: Accurate prediction of penoprime requirements is essential to adequate dust control during the dry season.

Section 2, Part II, Recommendations:

1. The direct combat support operations performed by the battalion during this reporting period presented unique challenges resulting in the lessons learned and recommendations included in Part I of this section. There are several significant general recommendations that can be derived from the experiences of the past 90 days.

2. During the reporting period the battalion participated in 18 major operations and a multitude of minor combat support missions. The changing tactical situation during this time necessitated rapid shift of forces and priorities. The battalion's huge area of operations and the variety of units supported made command, control, and coordination prime considerations in any tactical decision. The success of the battalion in its combat support missions was due primarily to the initiative and competence of junior officers and their non-commissioned officers operating in an independent and self-reliant manner. Air support for command and control is essential on a daily basis. The battalion's ability to provide equipment, materials, personnel, and repair parts to critical jobs must remain unimpaired. Therefore, I recommend that future missions be conducted with the following points in mind.

a. Dependable air support for transportation of equipment resupply, and command and control is essential to the battalion operations.

b. Emphasis on maintenance must be continued to insure equipment is available when required. It must be dependable when utilized for extended periods on remote job sites.

c. Air transportation of construction materials has had low priority. Materials for tactical construction should be given equal priority with men and materials and should arrive on site in conjunction with the tactical move.

3. The battalion's maintenance operation is severely hampered by a lack of spare parts. The low percent of fill in the battalion's prescribed load list cannot be improved unless requisitioned parts are received. The shortage of direct exchange parts in the DSU measureably increases deadline time. The figures quoted in paragraph 4h, section I illustrate that the battalion continues to operate only because maintenance personnel secure parts through channels other than those prescribed. Normal parts supply channels are apparently incapable of providing more than minimal support. I recommend that action be taken to

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determine the cause of the shortage of repair parts and steps be taken to make available those repair parts required to accomplish our engineer mission.

4. Operations of the 168th Land Clearing Task Force have encouraged the evolution of organizational and operational doctrine for land clearing missions. Initial emphasis upon organization has created the pending MTO&E. This should be implemented as soon as possible. Concentration upon improvement of cutting techniques has developed variations in the art of Rome plowing. This has resulted in higher daily cutting rates. As these concepts are refined by further experience, doctrine will change accordingly. The critical question presently concerning land clearing operations is how and where the land clearing team can best be utilized. The contrast is seen clearly in Operation Atlanta, the clearing of a base camp and logistical complex, and Operation Saratoga, the clearing of jungle to provide tactical security to a US base camp. The distribution of land clearing assets and the priority of clearing effort is clearly a tactical decision. The engineering aspects of land clearing are an important consideration in formulating this decision. The following facts have been proven by experience.

a. The Land Clearing Task Force is most effective when employed as a unit. It is least effective when fragmented.

b. Area clearing is more efficient than strip clearing.

c. Maximum efficiency is dependent on good maintenance.

d. Enemy activity offsets the rate of clearing.

e. Full denial of a base camp area requires total clearance.

f. Rome plowing of roads and fire support bases is an effective economy of force measure if the roads are to remain open indefinitely.

Based upon these precepts, I recommend:

g. That the Rome plow be regarded as a tactical weapon utilized to spearhead advances into enemy areas, carve cleared zones across suspected infiltration routes, locate underground base camp complexes and logistics depots; and level and render these complexes useless once they are found.

h. That the Rome plow be utilized as a passive security measure around base camps only when dictated by tactical necessity or when weather and trafficability prohibit other employment.

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5. The battalion's committment to combat support has precluded much of its work in base development. The three 1st Division base camps at Di An, Lai Khe, and Quan Loi are useable facilities with most essential construction completed. Projections for future construction are limited with the exception of Lai Khe which has considerable MCA work being planned to support the Division Headquarters relocation. During the battalion's peak combat support period approximately 75% of its effort was committed to tactical operations. Its minimum combat support committment was 35%. A certain amount of MCA and MER construction is needed to keep the battalion 100% committed. The work cannot be of such importance as to restrict freedom of action in committing units to combat support. I recommend that sophisticated construction projects and critical construction projects within the battalions area of responsibility be assigned to construction battalions. The remaining standard construction should be retained by the battalion for completion as tactical committments permit.

John R Manning

JOHN R. MANNING
LTC, CE
Commanding

14 Incl:
~~Incl 1: Organization Chart~~
Incl 2: After Action Report - Bu Dop
Incl 3: After Action Report - Song Be
~~Incl 4: After Action Report - Tongle Chon~~
~~Incl 5: After Action Report - Dong Xoai~~
~~Incl 6: After Action Report - Chi Linh~~
~~Incl 7: After Action Report - Operation Furgo~~
~~Incl 8: After Action Report - Operation Kunia~~
~~Incl 9: After Action Report - Operation Atlanta~~
~~Incl 10: After Action Report - Bon Cat Bailey Bridge~~
~~Incl 11: After Action Report - Dozer Field~~

Withdrawn, Hqs, DA

Incl 12: Figure 1: Utilization of 105mm Ammo Boxes
Incl 13: Figure 1: Use of Pit
Figure 2: Use of 5-ton Dump Truck
Figure 3: Use of 3/4-ton Truck
Incl 14: Figure 1: Expedient Anchor for MSAl Matting

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MCE-CO (10 Feb 68) 1st Ind
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR 65) for Quarterly Period ending 31 January 1968.

DA, HQ DAUANANG, 79TH ENGINEER GROUP, APO 96491, 22 February 1968

TO: Commanding General, 20th Engineer Brigade, APO 96491

1. The Operational Report - Lessons Learned submitted by the 168th Engineer Battalion has been reviewed and is considered complete and adequate.

2. Section 2 Part II para 5 concur. This headquarters is currently reviewing and revising missions assigned to all battalions to have the construction battalions control all MCA construction. This will allow the combat battalion to be free for operational support requirements, but still allow them to assist the construction battalions with the less sophisticated projects.

JOHN H. ELDER JR.
Colonel, CE
Commanding

Copy Furnished
CO, 168th Engr Bn

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AVBI-OS (10 Feb 68) 2nd Ind
SUBJECT: Operational Report - Lessons Learned (RCS CSFOR-65) for Quarterly Period Ending 31 January 1968

DA, Headquarters, 20th Engineer Brigade, APO 96491 2 March 1968

TO: Commanding General, USAECV(P), ATTN: AVCC-P&O, APO 96491

1. Forwarded for your information and action IAW USAECV(P) Reg 1-19, dated 15 April 1967.

2. This headquarters concurs with the ORLL submitted by the 168th Engineer Battalion and comments in the first indorsement, as modified by the following comments:

a. Section I, para 5: The shortage of NCO's in the grade of E-5 and E-6 is a brigade wide problem and is caused by lack of replacements from CONUS.

b. Section 2, Part I, para 1a, "Personnel Services": Banking by mail is available to servicemen in Vietnam.

c. Section 2, Part I, para 1b, "Personnel Accounting": Efforts are being made to alleviate this problem. Efforts to date include:

(1) Submission of a proposed MTOE authorizing a separate Land Clearing Company, rather than a Land Clearing Team.

(2) Request for authority to submit a separate morning report.

d. Section 2, Part I, para 2d, "Use of T-17 membrane as a dust control agent": Use of T-17 membrane in this fashion should be restricted to high priority construction, due to the high cost of T-17 membrane.

e. Section 2, Part I, para 2k, "Communications" and recommendation in para 14 of After Action Report - Bu Dop Airfield: Do not concur with recommendation of automatic relay station at Nui Ba Den. Recommend placing reliable personnel on site and replacing AN/PRC-25 radio with AN/VRC-46 to overcome atmospheric interference.

FOR THE COMMANDER:

CECIL D. CLARK
Major, CE
Adjutant

31.

FOR OFFICIAL USE ONLY

AVCC-P&O (10 Feb 68) 3rd Ind
SUBJECT: Operational Report-Lessons Learned (RCS CSFOR-65) for Quarterly Period Ending 31 Jan 68

HEADQUARTERS, UNITED STATES ARMY ENGINEER COMMAND
VIETNAM (PROV), APO 96491

15 MAR 1968

TO: Commanding General, United States Army Vietnam, ATTN: AVHGC-DST, APO 96375

The attached ORLL, submitted by the 168th Engineer Battalion (Cbt), has been reviewed by this headquarters and is considered adequate except as follows:

Item concerning maintenance, Section 2, Part I, paragraph 4g, page 22. Nonconcur. The radiator capacity of the D7E tractor is more than adequate as evidenced during equipment tests; however, the land clearing teams must take positive action to keep the radiator free of dust, mud, and leaves that will block the free flow of air.

FOR THE COMMANDER:

John Thatcher 1LT, AGC
for RICHARD B. BIRD
Captain, AGC
Assistant Adjutant General

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AVHGC-DST (10 Feb 68) 4th Ind CPT Arnold/twl/LBN 4485
SUBJECT: Operational Report-Lessons Learned (RCS-CSFOR-65), for the Quarterly Period Ending 31 January 1968

HEADQUARTERS, US ARMY VIETNAM, APO San Francisco 96375 2 APR 1968

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-DT, APO 96558

1. This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 January 1968 from Headquarters, 168th Engineer Combat Battalion as indorsed.

2. Pertinent comments follow:

a. Reference item concerning banking facilities, page 15, paragraph 1a; and 2d Indorsement, paragraph 2b: Concur. The following actions are being taken to improve banking services:

(1) Arrangements are currently being made by the Office of the ACofS, Comptroller in conjunction with in-country banking representatives to provide increased field coverage to personnel desiring to open checking accounts. This service will be offered to both newly arrived personnel while processing through replacement facilities and to personnel stationed at permanent base camps where banking facilities are currently nonexistent.

(2) Arrangements are being made with banking representatives to make travelers checks available for purchase by personnel upon departure from Vietnam.

b. Reference item concerning movement of a task force by air, page 17, paragraph 2f; and page 24, paragraph 2: Nonconcur. Priorities are established by the shipper, not the carrier. However, field force commanders set the order of shipment within priorities based on the tactical situation. The field force commander, as the overall tactical commander in the area, is in the best position to judge tactical needs within his area. Action has been initiated to identify request for movement of dump truck mentioned on page 17, paragraph 2f, and assure that it is moved as soon as possible.

c. Reference item concerning shortage of repair parts, page 22, paragraph 4h; and page 24, paragraph 3: Concur. Procedures to improve supply performance for repair parts in DSU/GSU have been initiated. They provide

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SUBJECT: Operational Report Lessons Learned (RCS-CSFOR-65), for the Quarterly Period Ending 31 January 1968

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for a reorder at 75% of the requesting objective (RO), use of issue priority designator (IPD) 05 for new items added to the ASL, and use of Red Ball expanded procedures for requisitioning up to 25% of the RO on parts reaching a zero balance and required to repair assemblies critical to the operation of a major end item. When recurring zero balances are experienced, these procedures provide for increasing of stockage levels up to twice the normal RO. These revisions should greatly alleviate the problem.

3. A copy of this indorsement will be furnished to the reporting unit through channels.

FOR THE COMMANDER:

CHARLES A. BYRD
Major, AGC
Assistant Adjutant General

Copies furnished:
HQ 168th Engr Cbt Bn
HQ USAECV(P)

GPOP-DT (10 Feb 68) 5th Ind
SUBJECT: Operational Report of HQ, 168th Engr Cbt Bn for Period Ending 31 January 1968, RCS CSFOR-65 (R1)

HQ, US Army, Pacific, APO San Francisco 96558 1 MAY 1968

TO: Assistant Chief of Staff for Force Development, Department of the Army, Washington, D. C. 20310

1. This headquarters has evaluated subject report and forwarding indorsements and concurs in the report as indorsed.

2. Reference 2d Indorsement, paragraph 2c(1); MTOE for Land Clearing Company is pending DA approval.

FOR THE COMMANDER IN CHIEF:

C.L. SHORTT
CPT, AGC
Asst AG

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COMPANY C
168TH ENGINEER COMBAT BATTALION
APO US Forces 96289

EBA-COC 14 November 1967

SUBJECT: After Action Report (Combat Support)

TO: Commanding Officer
168th Engineer Combat Battalion
ATTN: EBA-3
APO US Forces 96289

1. Name of Operation: Bu Dop Airfield

2. Dates of Operation: 15 August 1967 to 7 November 1967

3. Location: Bu Dop, South Vietnam

4. Command Headquarters: 168th Engineer Combat Battalion

5. Task Organization:

a. Organic Unit: 1st Platoon, Company C, 168th Engineer Combat Battalion.

b. Atchments: 1 ea bucket loader with operator from Company D, 1st Engineer Battalion.
2 ea D-6B bulldozers with operators from 362nd Engineer Company (Light Equipment).
1 ea D-6B bulldozer with operators.
1 ea 13 wheeled roller.
1 ea sheepsfoot roller.
1 ea towed grader.
1 ea D-4 bulldozer with operator from 557th Engineer Company (Light Equipment).
1 ea trailer mounted asphalt distributor from HHC, 168th Engineer Combat Battalion.
6 ea 2½ ton mutifuel dump trucks from 87th Engineer Company.
1 ea Adams motorized grader from 5th Special Forces Group (Airborne).

c. Detachments: 2nd squad from 1st Platoon, Company C, 168th Engineer Combat Battalion.

d. Supporting Unit: Operators as listed in paragraph 5(b).

Incl 2

Intelligence: The tactical area of operational responsibility of the Bu Dop Special [illegible] Camp contains a well used infiltration route from Cambodia into South Vietnam. At least 5 VC and NVA regiments operated in or on the fringes of this area during the airstrip operation. Several large contacts were made by CIDG forces operating out of the camp. A VC and NVA rest and training area exists across the border from the camp.

Several incidents occurred which strongly indicated the presence of VC sympathizers within the camp. During a practice alert, 33 barrels of diesel fuel were destroyed by automatic weapons fire from compound walls and the defensive wire. A second incident occurred when the front loader's fuel line was cut during the night, while the equipment was inside the compound. During one of the last nights at Bu Dop, a number of slings used for airlifting equipment out of the camp were cut.

7. **Mission:** To repair and modify the airfield at Bu Dop to C-123, Type II specifications.

8. **Concept of Operation:** To airlift personnel and equipment from Phuoc Vinh, Bien Hoa, and Xom Tom to Bu Dop and to coordinate with Detachment A-341, 5th Special Forces Group (Airborne) to repair, extend, and modify the existing airfield. This was to be done by reshaping and extending the runway 300 feet and capping the runway with laterite; recutting and improving the runway drainage system; and cutting or topping selected trees for approach zones. By 1 November the unit was to be prepared to airlift out of Bu Dop.

9. **Execution:** On 15 August 1967, the 1st and 3rd squads of the 1st Platoon were airlifted by CH-47 from Phuoc Vinh to Bu Dop. Coinciding with this movement, heavy equipment and operators from the 557th and 362nd Engineer Companies (Light Equipment) were airlifted, mostly by CH-54, from Song Be to Bu Dop. After arrival, the unit set up camp and made liaison with Detachment A-341.

After a preliminary inspection of the existing airfield, construction priorities were established. In order to enable fixed wing aircraft to use the runway as soon as possible, the initial prioity was to repair and reshape the existing runway. This work commenced during the afternoon of 16 August and was

it would have been desirable to make it somewhat greater. This was prevented because the Adams grader being used was very lightweight and was incapable of making a better crown. A particular advantage was gained because an excellent source of laterite was discovered less than 100 meters from the South end of the strip. This permitted a very short hauling cycle. Upon completion of the capping the turnaround and parking apron were peneprimed.

During rainy or wet periods, fields of fire for the Special Forces Camp and approach zones were cleared. A rough total of ten acres was cleared in those actions. Personnel and equipment were evacuated between 7 and 10 November 1967 by UC-1D and CH-47 helicopters.

10. Results:

a. Enemy Personnel Losses: None

b. Friendly Personnel Losses: None

c. Enemy Equipment Captured: None

d. Friendly Equipment Losses: None

e. Enemy Structures or Tunnels Destroyed: None

f. Significant Engineer Accomplishments: During a total of 15 days, 4818 cubic yards of laterite were hauled to the strip. During the first 11 days, 3 2½ ton dump trucks and one bucket loader were used.

When the project began, Bu Dop airstrip had been closed to all fixed wing aircraft for 3 months. After 10 days of work CV-2's could use the field, and on 24 October 1967, the first C-123 landed.

11. Administration and Logistics:

a. If the proposal in the mission order of daily Class I resupply had been followed, ration resupply would have been more than adequate. C rations were to have been eaten for the noon meal and A rations for the other two. Two to three days of A rations were received in each resupply. After consuming the A rations, C rations were eaten for all three meals for 1 to 2 days before the next resupply. Resupply aircraft was a problem, but all available resources were used by C Company and Battalion Headquarters to circumvent the limited aircraft situation.

b. Arms and Ammunition: The basic load of ammunition was taken by the platoon. This was sufficient for the entire operation.

accomplished by building the thick coat of mud off the strip, filling where necessary, and compacting the soil with the sheepsfoot roller. After the runway was compacted, it was sealed with a 13 wheeled roller. Runway drainage was also established at this time, as the rainy season was still in full force. Because the strip lacked a crown when the platoon arrived, extensive work was done to shape the runway to provide adequate drainage. After these tasks were accomplished, the rain would saturate the top 1/8th of an inch of the strip, but it was so well compacted that fixed wing aircraft encountered no slipping or skidding problems.

The filling, compacting, and grading of the 300 foot extension and 75 foot radius turnaround was next in priority. After the extension had been cleared of vegetation, it was decided that a large amount of fill was necessary in certain places. After the centerline and grade stakes had been surveyed, the filling began. The fill was obtained from the sides of the strip in order to level knolls which obscured the lateral clearance. Thus, the haul time was very short. The fill was placed in 3 to 4 inch lifts and compacted with the sheepsfoot roller and sealed with the 13 wheeled roller. The amount of fill was as much as fifteen feet in areas of the extension. The turnaround was constructed on a 90 foot radius, in order to exceed specifications. Drainage was a prime consideration; thus, a bulldozer blade wide drainage ditch was dug around the turnaround.

The construction of a 300 foot by 300 foot parking apron on the southeast corner of the airstrip was last in priority, This was relatively easy, as the ground already drained well and was up to grade. Thus only cutting, shaping, and compacting were involved in this phase of the operation. A $\frac{1}{2}$-30 inch culvert 150 feet long was installed at the south end of the parking apron and on 18 inch culvert 50 feet long was installed at the north end to provide access to the parking apron.

After the three major priorities had been accomplished, the strip, turnaround, and parking apron were capped with laterite. A six to eight inch cap was placed on the turnaround and touchdown areas and a three to four inch cap was placed on the rest of the runway and the parking apron. This was done in two to three inch lifts which were compacted with the sheepsfoot roller and sealed with the 13 wheeled roller. The grades on the runway were considerably reduced by the capping. The major difficulty was that while the crown was entirely adequate for drainage and performed well when it rained,

Demolitions were supplied by Detachment A-341.

c. Uniforms and Equipment: All uniforms and personal equipment were ordered through the unit supply on a personal need basis and were flown to Bu Dop on the resupply ship.

d. POL: POL was resupplied with CH-47's and C-7a's and was entirely sufficient.

e. Engineer Materials: Class 4 materials were adequately supplied.

f. Repair Parts and Maintenance: Many maintenance difficulties were encountered. This was partially caused by the unusual nature of the equipment used in the operation. The Adams grader, the D-6B bulldozers, and the 2½ ton dump trucks were items for which an adequate PLL was not carried. A second source of the problem was the difficulty in securing aircraft. A third source was the communications problem.

g. Communications: Radio communications with the company and battalion were handled through the relay station on Nui Ba Dinh. This was entirely inadequate. While the relay station was supposed to be in operation 24 hours a day, it was actually in operation about three times a day and was often hard to contact those three times because of the weather and its inadequate and erratic operating schedule. The relay station often transmitted messages erroneously and on occasions did not transmit messages sent to them within a reasonable period of time.

12. Special Equipment and Techniques: An adequate field expedient water distributor was constructed by mounting the tank from a water trailer on a 3/4 ton cargo trailer. The water was allowed to flow from the tank into the trailer and out the bottom of the closed tailgate.

13. Commander's Analysis and Lessons Learned:

a. Item: The operation at Bu Dop.

Discussion: The operation at Bu Dop went smoothly. The major difficulty at this location was that during the rainy season, roughly 50% of the working hours were lost because of the weather. The remoteness of the operation complicated the logistics.

Observation: Rain will curtail, considerably, operations undertaken during the monsoon season.

b. Item: Graders

Discussion: Towed graders have insufficient weight to adequately grade to the fine degree required for forward airfield missions; they are adequate for pioneer airfield missions.

Observation: Motorized graders with an adequate in-country PLL should be furnished for all forward airfield missions.

c. Item: Evacuation by air from forward airfields.

Discussion: Air Force fixed wing aircraft cannot be used to extract platoon TOE equipment from forward area strips because of the requirement that all equipment be pallatized. Without a forklift, loading full pallets on aircraft is impractical.

Observation: CH-47 and UH-ID helicopters should be used to evacuate all equipment except vehicles.

d. Item: Medical difficulties.

Discussion: The major medical difficulty was the high incidence of ringworm.

Observation: Adequate medical supplies to combat this health problem should be taken on such operations.

e. Item: Expedient soil drying method.

Discussion: Areas were encountered where the soil was heavily saturated with water. To expedite workability of the saturated area diesel fuel was applied and fired.

Observation: This action proved highly successful and saved numerous days of delay in waiting for the natural drying process to occur.

f. Item: Use of the sheepsfoot roller.

Discussion: The red soil found at Bu Dop, tentatively classified as basalt soil, was found to be very satisfactory for base material. In compacting it with the sheepsfoot roller, the discovery was made that the shearing stress of the soil was exceeded when the roller drums were filled to capacity. With drums filled to two-thirds capacity, excellent compaction was achieved when the soil was at optimum moisture content.

Observation: The weight of the sheepsfoot roller should be adjusted to soil types.

g. Item: Peneprime Loading.

Discussion: A pit one bulldozer blade wide and as deep as the height of the asphalt distributor was dug. With this pit, loading the asphalt distributor involved very little barrel movement so that a peneprime crew of three men was sufficient.

Observation: A pit is the suggested method for loading peneprime.

h. Item: The occurrance of laterite.

Discussion: Preliminary investigation indicated that laterite was present along the entire 120 meter contour line which completely encircles the hill on which the Special Forces Camp is located. This would indicate that there was perhaps a sheet of laterite running through the hill. This sheet is at least twenty feet thick and the laterite becomes progressively more massive with depth. On top of the laterite is a basalt soil which makes a sharp contact with the laterite. The water table is approximately fifteen feet into the laterite. Although bedrock was never reached, geologic maps of USAECV (P) indicate that it is basalt. The laterite is of very high quality.

Observation: This data may indicate that there is a progressive weathering of basalt to form just laterite, and then basalt soil.

14. Recommendations:

a. Motorized graders should be furnished for all forward airfield operations.

b. The use of D-6B tractors should be limited to missions of less than 30 days duration because of the logistic and maintenance problems encountered with them. The assemble and dissassembly times encountered with D7E's is well spent on missions of more than 30 days.

c. The radio relay station at Nui Ba Dinh should be converted into an automatic relay station. The human element at this location is unreliable.

d. Whenever possible, US or Regular ARVN troops should be utilized as security for forward area airstrip operations. Difficulties were encountered with the CIDG troops. They are irregular soldiers and do not have the discipline to be reliable as security.

c. Equipment borrowed from other units, not organic to the using unit, should be furnished with a PLL.

/s/ Joseph P. Kish
/S/ JOSEPH P. KISH
CPT, CE
Commanding

A TRUE COPY:

D. F. LANE
CW2, USA
Adjutant

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AFTER ACTION REPORT

SONG BE

Inclosure 3 to Operational Report - Lessons Learned for the Quarterly Period November 1967 thru January 1968

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DEPARTMENT OF THE ARMY
COMPANY D, 168TH ENGINEER COMBAT BATTALION
APO San Francisco 96289

EBA-COD 1 January 1968

SUBJECT: After Action Report, Combat Support

TO: Commanding Officer
168th Engineer Combat Battalion
ATTN: EBA-S3
APO San Francisco 96289

1. Name of operation: Song Be Fire Support Base

2. Dates of operation: 1 September 1967 to 5 December 1967

3. Location: Phuoc Binh, RVN; Coordinates YU 143073

4. Command Headquarters: Company D, 168th Engineer Combat Battalion

5. Task organization:

(a) Organic Units:

(1) 1st Plt, Co D, 168th Engr Cbt Bn, 1 September 1967 to 5 December 1967.

(2) 3rd Plt, Co D, 168th Engr Cbt Bn, 1 September 1967 to 22 October 1967

(3) 2nd Plt, Co D, 168th Engr Cbt Bn, 3 October 1967 to 22 October 1967.

(b) Attachments:

(1) 12 men, 557th Engr Co (LE)

(2) 2 men, 3rd Maintenance Co, 610th Maintenance Battalion

(3) 1 man, 34th Engr Bn

(4) 5 men, HHC, 168th Engr Cbt Bn

(c) Detachments: None

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(d) Supporting units:

(1) 1st Battalion, 18th Infantry

(2) 35th Ranger Battalion, ARVN

(3) Mobile Strike Force Company, 1st Mobil Strike Force Battalion

(4) Armored Cavalry Troop, 5th ARVN Division

6. Intelligence: The artillery site is located west of Nui Ba Na at the paved airstrip. Enemy contact in the area was sporadic prior to the arrival of the guns. Units up to company-size had been spotted. Immediately after arrival of the 175mm guns more incidents were reported, but of smaller-sized units. Toward the end of the project units were again regrouping to company-sized, and occasional reports were received of battalion-sized units operating in the area. VC activity increased significantly after arrival of the guns and American troops.

7. Mission: (a) Construct an artillery fire support base with four gun pads, a Fire Direction Center, a weather station, four corner bunkers, four defensive bunkers, latrines, showers, an 8' high berm around the base, and an interior road net with drainage.

(b) Provide technical supervision to the Artillery customer units in the construction of four crew bunkers, four ammunition storage bunkers, an executive post bunker, a communications bunker, and ten(10) 10'x20' personnel living bunkers.

(c) (added) Assume construction responsibility for (b) above. Provide technical supervision in the construction of tactical defensive wire barriers and additional defensive bunkers. Clear land surrounding the camp to a distance of at least 300 meters for fields of fire.

(d) (added) Clear 50 acres of land in Song Be for fields of fire for ARVN 155mm guns.

(e) (added) Construct a 100' radius turnaround at each end of the airstrip and a 245' X 750' parking apron with two 40' wide taxiways to the airstrip. Both the turnarounds and the taxiways are to be pene-primed and capable of C130 traffic.

(f) (added) Aid Special Forces Detachment B-34 in construction of a new detahcment compound at Song Be.

8. Concept of Operations: (a) Company D, (-) 2nd Platoon will deploy to Bien Hoa by road and thence to Song Be Airfield by air. 2nd Platoon

will join the company at Song Be by air lift from Loc Ninh upon completion of their prior mission.

The sequence of construction will be the berm and defensive bunkers, Fire Direction Center, weather station bunker, showers and latrines, prior to the arrival of the artillery battery. The road net and gun pads will be finished after the arrival of the battery and concurrent with the technical supervision of the remaining construction facilities.

(b) The concept of operations was modified on 23 September to reflect the new scope of work. The crew and ammunition bunkers were to be completed prior to the start of the personnel bunkers.

Work on land clearing and technical assistance to the Special Forces Detachment would be accomplished as other priorities permitted. Land clearing priority was to the 175mm gun position.

9. Execution: On 1 September 1967, two platoons of Company D, 168th Engineer Battalion displaced from Bien Hoa to Song Be (Phuoc Binh), RVN. The move was made in two phases over a three day period. The initial phase was a road march of all elements to Bien Hoa AFB where the materials, men, and equipment were loaded aboard C130s and C124s. Nine sorties of C130 arrived with the majority of the company and its equipment the morning of the second. The 3rd of September the remaining personnel, the programmed construction materials, and one of the three D7 E bulldozers arrived at Song Be on nine C130 sorties and one of the C124 sorties. The remaining two D7Es arrived the next day on two C124 sorties.

The first night the company was at Song Be two rounds of enemy mortar fire were received in the general area. The next two nights also saw enemy mortars fall in the area. The infantry battalion, 1st Battalion, 18th Infantry, provided security ranging along an area about 500 meters by 200 meters. Later when they came back the second time they spread out farther and eliminated the mortar fire by denying the mortar positions within range. The engineer troops were integrated into the expanded infantry perimeter and augmented the infantry guard. This method had the advantage of quickly training the engineer troops in night defense but also had the disadvantage of disrupting any unit integrity of the engineer troops. This close intermingling also led to some problems in the control of personal and unit equipment.

The morning of 4 September 1967, work on the project began. The engineers had been instructed to provide the materials for the gun pads and the latrines and showers. The remainder of the material was to be flown in by the artillery. The engineers were to construct the berm with the corner and intermediate bunkers, the gun pads, and the Fire Direction center and the weather station bunker; the remainder of the project was

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to be self help with engineer supervision. The first indication of possible materials problems came when the construction of the berm bunkers started to outstrip the available construction materials and some substitutions had to be made from the lumber scheduled for the lower priority gun pads. This indication was later to become a major problem. The actual construction priorities were based on the availability of materials, the current customer priorities, the changing responsibility for construction, and the physical availability of space within the berm.

Additional lumber started to arrive on the seventh of September. The unit on site kept track of what material was delivered even though they did not know from whom it was shipped. It was quickly decided to use all lumber as necessary without regard to which building it had been ordered for. Substitutions in size at the pickup point prior to shipment meant that continual substitution had to be made on the project. Later this caused difficulties when figuring out what lunber still remained to be picked up and shipped.

By the arrival of the mainbody and guns of the artillery the berm was 85% complete, the first gun pad was 95% complete, and the corner and intermediate bunkers were 85% complete. The intermediate bunkers were completed on 10 September. The FDC and metro (weather) bunker were 50 and 60% complete. The failure of the engineers to meet the programmed completion date of the critical facilities was not due to engineer channels. Delays in material reception required that some priority projects be shelved until the proper parts (e.g. rafter joists and drift pins) arrived on site. Although this did not significantly effect the overall completion date, it did effect the order of completion of specific buildings.

On 9 September the security force was replaced. The 35th ARVN Ranger Battalion replaced the 1st Division troops on site. Their perimeter was entirely around the construction and bivouac site and patrols were conducted continually day and night to a distance of 3000 meters. This aggressive defense accounts for the fact that only once in the month they were there was the company mortared.

By the fifteenth the FDC was completed. The work on the metro bunker was stopped for lack of any tarpaper; tarpaper had been sitting at the loading ramp at Bien Hoa for three days but could not be shipped as it had too low a priority. The nineteenth the metro bunker was finished, the same day that the tarpaper arrived. By the 21st the company was working on the road net, personnel bunkers, drainage and searchlight pads. The corner bunkers, FDC, metro and commo bunkers were finished. That day the first of many repairs caused by muzzle blast form the 175s were made. The blast ripped the tarpaper off, blow the post inward and the siding outward. A significant amount of time was lost due to repairs and lost time when a fire mission prohibited engineer troop effort from working in front of the muzzle.

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On the 23rd BG Murphy, Artillery Commander, II Field Forces (V), arrived on site to review the project. Unsatisfied with the rate at which the artillery-sponsored construction was progressing, he returned to request that engineer effort be allocated to complete all construction at the site. This request was approved and the engineers assumed control of all construction. It quickly became apparent that the engineers would also have to consolidate the responsibility for procurement and shipment of construction materials to the site. This assumption took the remainder of the project to accomplish.

By the 25th work on the gun pads had stopped. The change in gun pad design and the addition of revetments around each pad plus the borrowing of materials to complete the higherpriority projects had sapped the materials. The same day the roofs of the bunkers started to leak after a heavy rain. The rain had been trapped in the layers of sandbags and was dripping through the tears in the tarpaper. The roof was retarred using a hot tar all over the seams; extra care was taken to insure that the tarpaper was not ripped as the sandbags were replaced. The roof did not leak again.

On the 27th the scope of work was increased again to reflect nine 10x60' personnel bunkers instead of the five originally decided. The five 10x60' bunkers were themselves substitutions for ten 10x20' bunkers that would have taken up the same space with only 2/3 the room. Col Jansen directed that all buildings would have drift pins between the caps and posts to protect against blast. The lack of incoming construction materials made a work stoppage likely before the end of the month. Although this stoppage did not occur it was only through substitution of lower priority projects for which material was available. Rafter material became available ten days later and buildings were again completed.

The night of 2 October saw enemy activity at Song Be. Approximately fifteen 60mm mortar rounds fell in the area of the ARVN security CP. 1 KIA and 6 WIA from the ARVN was the result. The attack might have been longer but for quick action of one ranger who was in the village from which the fire was coming. He rushed the position immediately, and the firing ceased as the enemy withdrew. The reason for this attack is believed to be the known withdrawl of the ARVN Rangers security force to Bien Hoa. The Rangers pulled their far out patrols in readiness for the flight. These patrols were not reestablished until after 1630 when they learned the move had been cancelled. Apparently the Viet Cong followed the long range patrols in close as they withdrew and then hid until nightfall. They set up their position less that 100 meters from the local National Police Force Building.

The morning of the third the second platoon arrived from Loc Ninh having finished a previously assigned mission. Four C130 sorties were required to move the platoon by air from Loc Ninh to Song Be. By this time all construction but two crew bunkers, five personnel bunkers, one gun pad and parts of two more gun pads were completed. The crew bunkers

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SUBJECT: After Action Report, Comb[illegible]u[illegible]ort

were finished on the 10th of October. That day an addtional task of helping the ARVN 155 battery by clearing fields of fire was assigned by Gen Weyand. From then on the dozer work was divided between continuing the clearing of fields of fire around the 175 position and helping the ARVNs.

By the 14th the ammo bunkers were all completed, and by the 18th only the five personnel bunkers remained. The relatively small amount of work remaining and the slow trickle of new construction materials dictated that the majority of the unit move back to base camp. The company was scheduled to move out on the 20th, but no scheduled sorties arrived. Out of the eight sorties scheduled only three arrived. The remaining five sorties were procured at the site on planes returning empty to Bien Hoa. At the same time that the company started to depart, the remaining lumber started to arrive. It would have been preferable to leave the company in place three or four more days had the arrival of the lumber been assured, but the move was committed. Ten dump trucks, two frontloaders, one grader, three dozers, one contact truck, and one jeep remained behind to complete the earthwork. The engineers had been given the additional mission of emplacing a 245 x 750' parking apron with access taxiways and two turnarounds at the ends of the strip. This was mainly an earthmoving job and so a large share of the units vehicles remained behind.

After the departure of the main body two factors slowed down the completion of the assigned missions. The available nonengineer security of the haul road and laterite pit became almost nonexistent, and the engineer commander was forced to pull engineers off bunker construction to secure the airfield laterite haul. This significantly slowed work inside the berm. The other slowage was caused by a mortar attack the night of the 25th which damaged four trucks for a period of more than a week and disabled other trucks for shorter periods of time. An additional slowdown occurred later in the project when a brigade of the 25th division moved into Song Be. Their logistical base and the large flow of supplies into the area covered the new hardstand and forced the engineers to stop work in some areas that otherwise might have been completed earlier.

The night of the 12th, Song Be was hit again. Only four rounds came inside the berm, but one round hit the sandbags around the tent where the engineer mechanics and drivers were sleeping. Two men were wounded seriously enough to be evacuated, and one man, SP4 Gary L. Farley died before he reached the hospital.

The tempo of work picked up even more; the engineers wanted to get away from this high risk zone. A peneprime distributor, deadlined for a broken fiber clutch plate was bolted for direct drive and worked well. Peneprining, the critical path of the operation, was accomplished with a trailer mounted kettle. A five ton dump truck pulled the kettle and supplied the platform for dumping the barrels of peneprime and diesel into the distributor. A frontloader placed the full barrels of diesel and

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peneprime into the dump bed; the empties were thrown over the side and retrieved by the frontloader. This enabled continuous operation of the spreader.

Again the 24th mortar rounds were received in the area (ninety 82mm), but no damage was incurred to either engineer personnel or equipment. On the 26th the remaining equipment was flown out of Song Be on a space available basis. The peneprimin continued until the 4th of December. All personnel closed to Di An on the 5th of December. Of the fourteen scheduled sorties to extract the equipment, ten of these were arranged for at the site between the engineer commander and the pilot at the site.

10. Results:

(a) Enemy Personnel losses: None

(b) Friendly Personnel losses: 1 KIA, 7 WIA

(c) Enemy equipment captured: One 26 pound Claymore

(d) Friendly equipment losses: None

(e) Enemy structures destroyed: None

(f) Acres cleared: 200

11. Administration and Logistics

(a) All logistic support was by air. Rations, equipment, and other administration logistics were shipped directly from Di An. All construction materials were shipped from Bien Hoa by air.

(b) During the period 1 September 1967, to 14 September 1967, the company fed up to 36 additional personnel sent by various customer units to coordinate or act as advance party. The period 23 October to 5 December 1967, the artillery battery (B Battery 6/27 Artillery) fed the remaining engineer platoon.

12. Special equipment and techniques: None

13. Commanders analysis and lessons learned.

(a) Analysis: The operation was rewarding to the company in two ways. First, as a shakedown field exercise, this operation gave the company the opportunity to review the techniques and equipment necessary for field operations and to define those areas which were initially weak. A new procedure of field maintenance and supply were initiated and some areas reemphasized which had not been necessary in garrison living. One area of definite resurgence was continual supply accountability. In an

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Area intermingled with various other units coming and going, personal gear and sensitive items common to all units had to be watched much more closely. The second benefit was the construction of a major facility from start to finish. The morale of the company benefitted from the knowledge of a job well done and recoggized as an example. An additional mixed blessing was the highlighting of the serious deficiencies in the unit's TO&E equipment. Many items had to be borrowed to efficiently work under field conditions, and the problems encountered in borrowing and returning the equipment pointed out the advisability of equipping the company with its own TO&E items.

With the start of construction another difficulty arose. A signal battalion, 3 artillery battalions, and a target acquisition all had troops which were to be stationed within the compound. Each unit and battalion commander had a share in the plans for construction and for the initial phase of construction, the engineers had innumerable sources all requesting changes in scope or priority of work. The difficulty was resolved with the heavy battery commander, who was to be the camp commander, being appointed as the sole customer representative. From this time forward engineer planning became significantly easier.

The original construction scope and priority of work underwent numerous changes during the time of construction. These changes were engandered by the tactical situation and desires of the customer, the availability of construction materials, the inability of the customer unit to build its share of the camp in the required time frame, and the physical space limitations inside the camp area. Both before and after one customer spokesman was appointed, the customer units continued to shift the priorities of construction as new areas became critical. It is believed that future operations will not experience this difficulty as the experience factor was determined on this prototype. The final priority was for the physical protection of the site from ground attack first, followed by the construction of a hardened Fire Direction Center, communications bunker, and weather station bunker. The next priority was for the remainder of the operations half of the camp, the crew ready bunkers, and the gun pads. The last priority was for the personnel living bunkers. The nonavailability of construction materials was caused by numerous factors. The change in design of many of

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the buildings required new bills of materials and lead time to acquire the materials. Many of the sizes of timbers required were extremely scarce at the time of construction, and the priority of available flights for construction materials often left lumber sitting at Bien Hoa AFB for seven days or more until the missions became available. The above delays had to be anticipated,; however, some of the delay and confusion over construction could have been avoided. The original agreement was for the customer unit to furnish all the construction materials to the site for all parts of the construction except the gun pads. This agreement made sense at the beginning when the artillery was scheduled to build almost all of the other structures at their own speed, but the idea proved to be impractical. Some of the lumber was not ordered, and some of the lumber that was ordered was not ready to be shipped on time. This was mainly due to the artillerynot having experience in shipping materials by air. Later the engineers started to augment the artillery efforts through their own channels. Unfortunately no one knew exactly what had been ordered or shipped by whom against what bill of materials. At one point at least three different battalions were shipping materials to Song Be without knowledge of what the others were doing. The substitution of lumber sizes for nonavailable sizes also increased the difficulties. At one time 4x4 material was shipped by the customer unit in lieu of 4x8 material. All this lumber was useless for the purpose as it was intended for rafters; the customer unit did not check with the engineers before making the substitution. The situation was straightened out only at the very end and caused some slowdowns in schedule while waiting for the paperwork to be straightened out.

Food was another area of concern. Until the main body on the artillery arrived with its kitchen, the engineers were the only unit to have a mess hall at the location. The availability of the mess hall caused all the units with advance parties or small groups engaged in construction activities at the site to assume that the engineer mess could feed their men without any difficulty. On one or two days notice additional personnel would arrive and expect to be fed. The lead time for ordering rations is ten days and all rations had to be flown in from Di-An as none of the other units had any air support. This became quite a burden at times as the engineer company was feeding up to 38 additional people that had not originally been programmed for rations. Cold storage for the necessary was insufficient for the amount of food that had to be stored and some food was destroyed after being without refrigeration too long. This latter problem was not alleviated by the erratic arrival of scheduled resupply sorties. Sorties scheduled to pick up food at Di An in the morning would sometimes not arrive until late afternoon. The perishables stored at the loading site either had to be returned to the units cold storage or scrapped. Sometimes this was the only alternative when the flight was repeatedly promised to be showing up immediately only to be 4 hours late.

The initial survey made by the engineer surveyors caused some heartache later on. The artillery wanted the maximum room inside the berm subject to the clear zone restrictions along the airstrip and the road. The

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initial survey proved to be off by 90 to 150 feet in measuring the distance between the road and the airstrip. The artillery got the size interior specified on the plans, but the size could have been much larger. The mistake was realized too late to change the dimensions of the area.

Plans for the project were scarce throughout. While constructing four bunkers simultaneously, the company had only two sets of plans. The response time for additional plans was so long that usually the building was completed about three days before the plans arrived on site. Some of the plans had been made too hurriedly. The bracing for the walls and the timber size of the roof decking were the most flagrant errors. Bracing for the floors and the entranceways were also in error.

The artillery and the engineers were at odds over the use of the large 175mm guns. The tremendous static and dynamic pressures generated by the muzzle blast wreaked havoc on the buildings under construction. Once a building was completed and sandbagged it withstood the blast well, but during construction and before sandbagging the buildings were ripped apart by the guns. One crew ready bunker was rebuilt five times before it was finished. The static pressure would blow the walls and posts in 2 or 3 inches and then the dynamic pressure would suck the walls away from the posts and outward 2 or 3 inches. Pinning the posts to the caps with drift pins solved part of the problems, but only sandbagging solved the destruction of the siding and tarpaper. The engineers and artillery reached a solution whereby the artillery repaired any damage done once the building was finished the first time unless there was major structural damage. The engineers rebuilt any buildings damaged structurally.

The final area of friction came between the Air Force and the engineers over the use of the new parking area. Before the new areas had been final graded or compacted C130's would start to use these areas to offload. The large volume of aircraft arriving at one time was responsible for the use of the new areas, but the subsequent unhappiness the Air Force voiced over the state of what they thought was the finished product could have been eliminated if there had been some method for the ground aerial port team to contact the planes by radio. In spite of continual heavy traffic at the airfield no radio contact was available except when a combat control team was sent in for a day to handle unusually heavy troop movements. The incoming pilots would not know where they could not go and would invariably cross the new area. The offloading was also often conducted on the new areas with the area being used for the storage of cargo. This hampered the construction effort in two ways. First the area was not available for final grade and compacting during the time cargo was piled on it, and second, the forklifts left deep gouges where the lounges dug into the laterite to get underneath the pallets. Continual coordination with the aerial port team at the site eliminated most of the problem, but it plagued efforts to some extent until the end.

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14 Recommendations:

a. All materials anticipated for use by an engineer unit should be at the site before the constructing engineer unit is flown in if the materials hauling is to be done by air.

b. Units should be provided their own organic TO&E equipment before deploying to the field. A poor substitute is hand receipting the equipment from other organizations. If hand receipting is required, sufficient time in advance should be allocated so that the gaining unit can properly inspect the equipment under joint inventory with the losing unit.

c. Prior coordination with all supported and supporting units should indicate the engineers desires in the way of security; this especially applies to hauling fill or laterite from a distant pit.

d. When constructing emplacements for a heavy artillery battery, the battery should not be moved to location until after the construction has been completed. Earlier movement places too many people in each other's way, and the shock from the muzzle blast disrupts construction effort and destroys the partially completed buildings.

e. A regularly scheduled aerial resupply should be scheduled for the field unit. This is especially true for an engineer unit which must constantly move repair parts and construction materials not previously required to the forward location.

f. A concerted effort should be made to have all personnel attached for rations accompanied by a copy of their orders. This not only helps to alleviate much bookkeeping at the unit messhall, but also requires the owning unit to definitely identify the location of their men for purposes of clothing resupply and mail.

g. All items of engineer or ordance equipment should be accompanied by an operator from the owning unit. This eliminates misunderstandings on the methods of use and abuse of the equipment and its maintenance.

RAYMOND E. KNILL
CPT, CE
Commanding Officer

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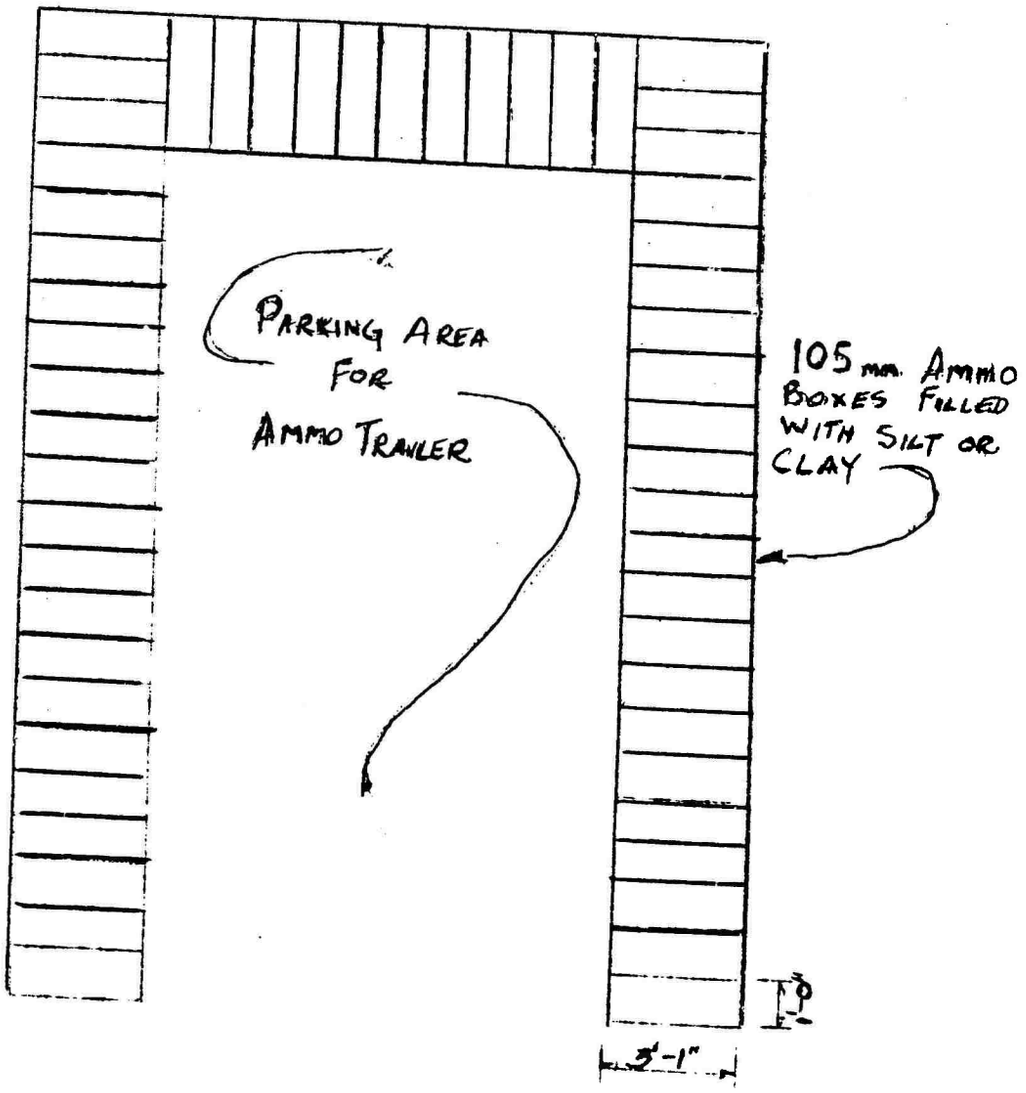

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Figure 1: Utilization of 105mm Ammo Boxes

Inclosure 12 to Operational Report - Lessons Learned for the Quarterly Period November 1967 thru January 1968

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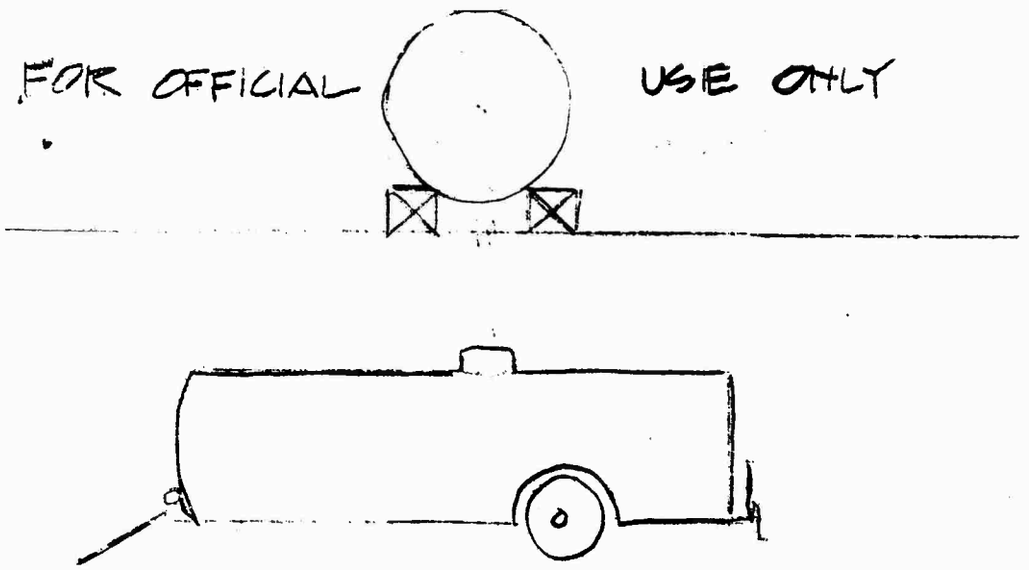
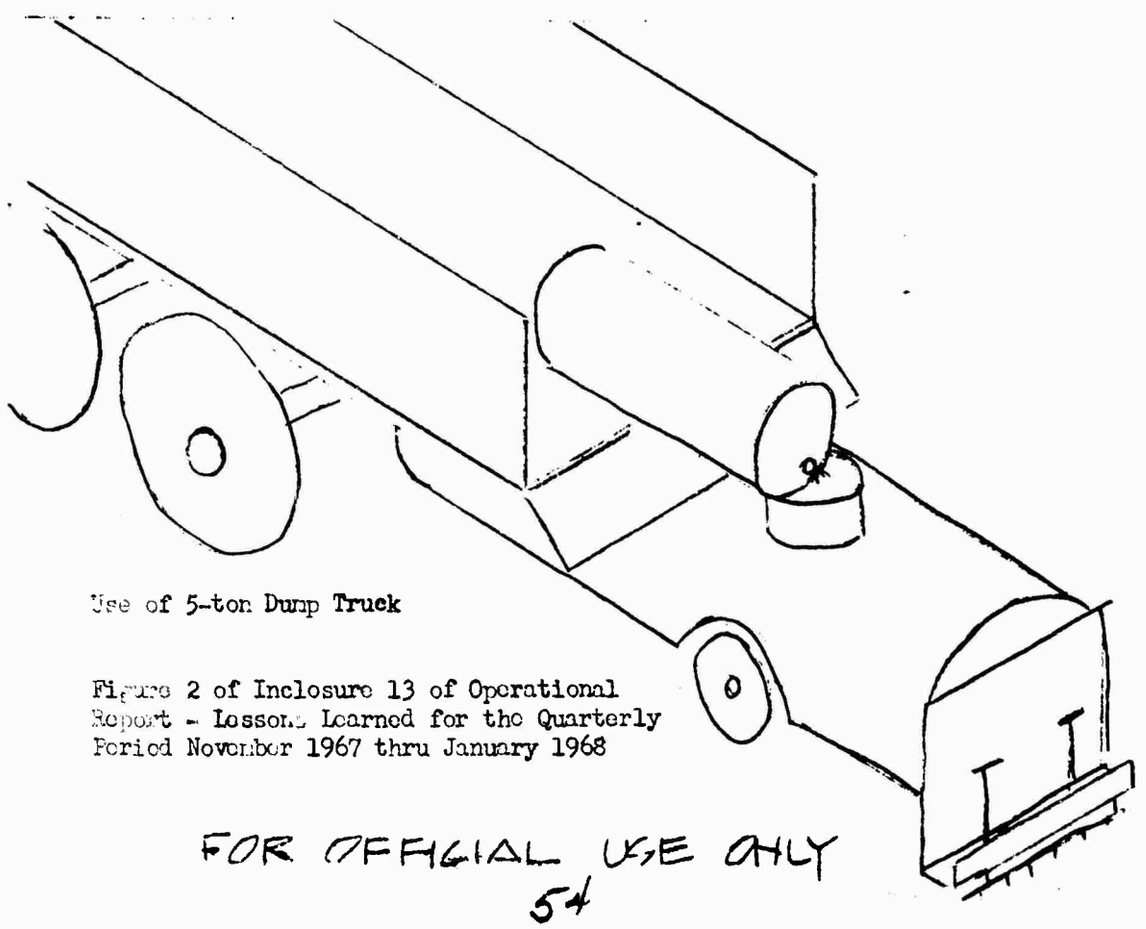


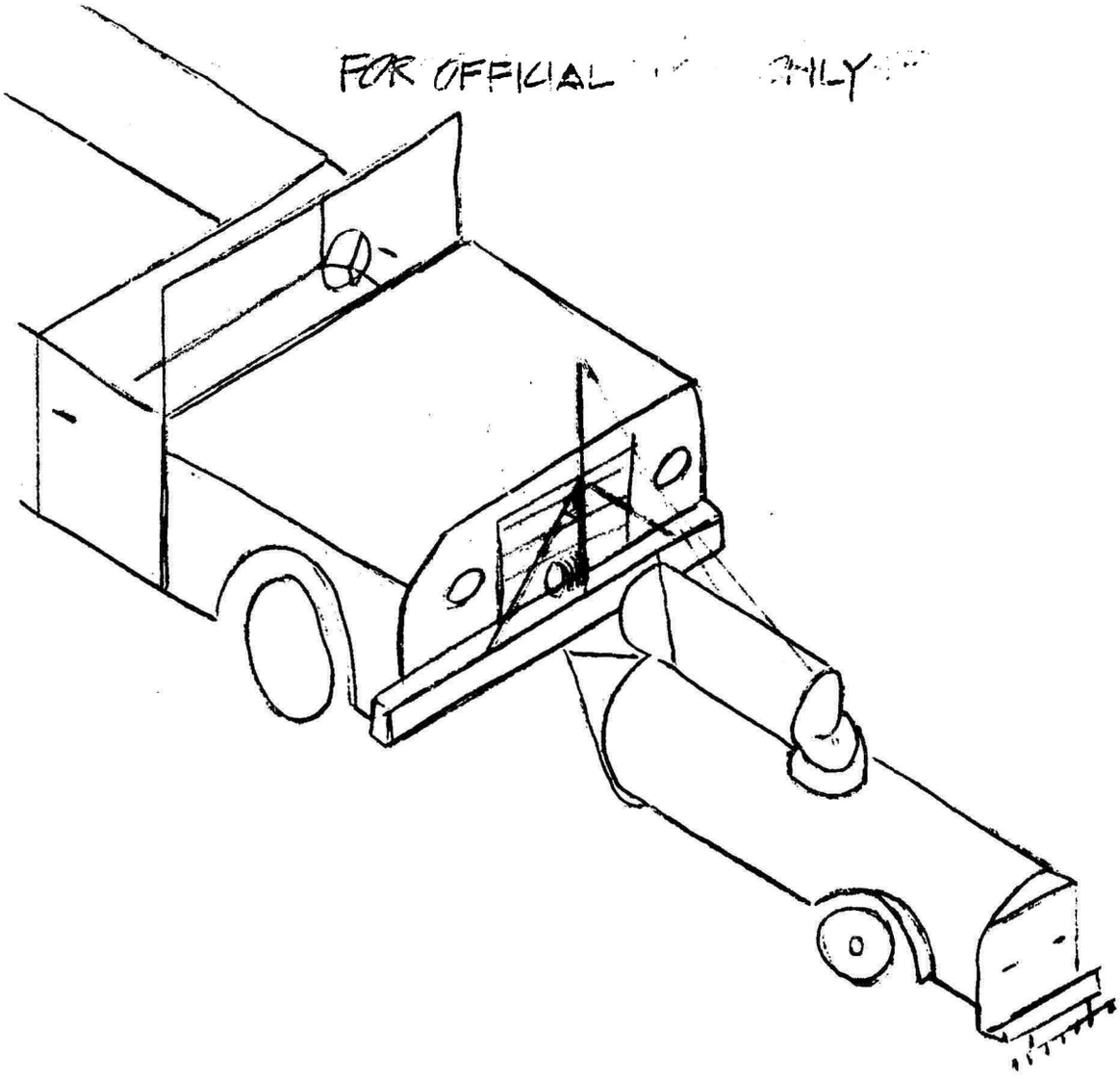
Use of Pit

Figure 1 of Inclosure 13 to Operational Report - Lessons Learned for the Quarterly Period November 1967 thru January 1968



Use of 5-ton Dump Truck

Figure 2 of Inclosure 13 of Operational Report - Lessons Learned for the Quarterly Period November 1967 thru January 1968



Use of 3/4-ton Truck

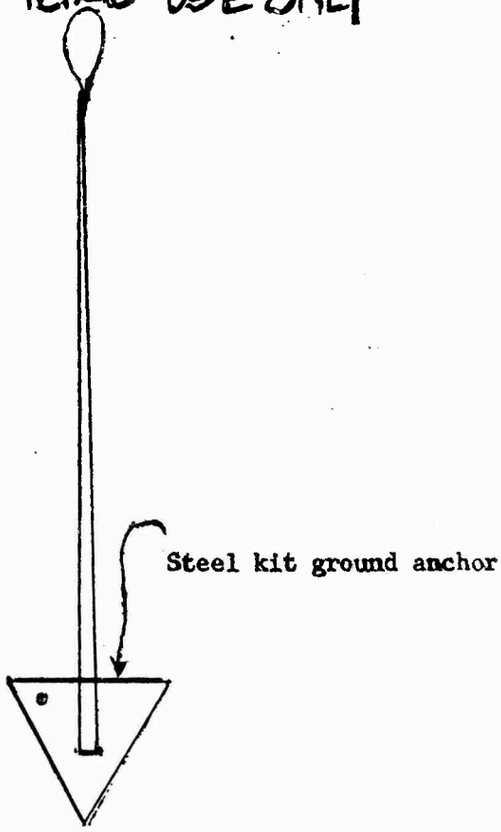


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Figure 1 to Inclosure 14 to Operational Report - Lessons Learned for the Quarterly Period November 1967 thru January 1968

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